

THE JOURNAL
OF THE
ANTHROPOLOGICAL INSTITUTE
OF
GREAT BRITAIN AND IRELAND.

MAY 11TH, 1897.

E. W. BRABROOK, Esq., F.S.A., *President, in the Chair.*

The Minutes of the last Meeting were read and signed.

The following communication was read by the author, with lantern demonstration:—

“The Anthropological Features of the External Ear.” By A. KEITH, Esq., M.D.

Dr. GARSON, Professor THANE, Messrs. HOLMES, TINS and LEWIS took part in the discussion, and a vote of thanks to the author was passed.

VOL. XXVII.

M

*On COMPLEXIONAL DIFFERENCES between the IRISH with
INDIGENOUS and EXOTIC SURNAMES respectively.* By
JOHN BEDDOE, M.D., LL.D., F.R.S.

THOUGH Grattan and Sir William Wilde began long ago the investigation of the physical characters of the Irish, but little has been done since in that direction until quite lately, when Professor Haddon and Dr. Browne have produced two very interesting monographs on the inhabitants of some of the islands off the western coast, Aranmore, Inisbofin and Inisshark. One of the points they bring out is the comparative lightness of the iris, whereas the hair, especially in the latter islands, is generally dark. In fact, this prevalence of the combination of dark hair with light eyes is, as is generally known, an Irish characteristic. It occurs, however, almost as conspicuously in the Scottish Highlands and in a less degree in some parts of Wales, such as the hundred of Cemmes in Pembrokeshire, in parts of the West of England, as Exmoor and South Devon, in Bretagne and elsewhere. The combination is decidedly uncommon in Germany, at least among the true Germans, but comes into comparative prominence as one proceeds eastwards, with the increasing prevalence of the Slavonic element. It will hardly do, therefore, to accept without question the interpretation of it which at once suggests itself, viz., that the light iris is the result of natural selection in a climate where there is no need of much pigment to protect the retina from overmuch or overbright sunshine. Whatever its origin, it has now become a race-character.

It has occurred to me that it may be of interest to enquire how far it is common to both the two great sections of the Irish people. I will call these, for the sake of brevity, indigenous and exotic respectively; these names are convenient, and though their correctness may easily be impugned, they are every way better than those of Celt and Saxon, which are too commonly employed.

By indigenous I should mean, if it were possible to separate them, the descendants of the people who were at home in Ireland, before the days of Thorgils, and Olaf, and Sigtryg Silkebeard and Magnus Barefoot, and by Exotic the Danes, Norwegians, English, Welsh, Scotch, Huguenots and Palatines who have settled there at various times subsequently. I shall not now enquire how far these indigenæ were the descendants of early or late invaders, whether it was to Iberians or Atlanteans, or to Gael, that they owed in the main the type or types which they

have transmitted to our own times. I will merely say that their ancient poems indicate a diversity of colour among them, that the admiration for fair hair would lead one to think that it had been common in the latest conquering tribe, and that amalgamation was far from complete, while the attribution of blue eyes and black hair to the handsome Diarmaid shows that that combination existed, was known and admired.

Later on, in the middle ages, it is curious that we have, so far as I know, no evidence as to the prevailing complexion of the Irish. Mac Firbis's oft-quoted description of the three elements of the indigenæ, the dark Firbolgs, the blond Tuatha Dé, the Milesians white of skin, brown of hair, only gives us to understand that all these varieties existed, as they did and indeed do almost everywhere in Europe. There is indeed a story (but I have forgotten whence it comes) of some one meeting with people in a skin-boat off the western coast, who "had long yellow hair, *like the Irish*." Giraldus, who knew both the Welsh and the Irish, and who lets us know that the former were of dark complexion, has nothing to say about the Irish from that point of view. All we know is that the native Irish were tall and strong, and swift of foot, and some say also comely.

Dr. Morton, the great American anthropologist, describing the Irish type as known to him, said "eyes and hair light." It is probable that in his day the Irish emigrants to America came in larger proportion from the eastern parts of Ireland: moreover Morton was a student of the dark native American races more especially. In Baxter's great work on the military statistics of the American war, the order of complexion is as follows, going from the fairest to the darkest—Englishmen, Irishmen, Germans, United States men, British Americans, *i.e.*, Canadians, etc. The Anthropometric Committee of the British Association, owing, in my opinion, to the unfortunate adoption of an artificial method of classification, ascribe to Ireland more of light hair, and less of red and dark hair, than they do to either England, Wales or Scotland. My own observations, extending to about 10,000 persons, show almost everywhere a great preponderance of light eyes, and in most parts of dark hair, the exceptions being in some cases explicable by the probable presence of a large exotic element.

I have said that I would like to make a comparison of the two elements, the exotic and the indigenous, in order to find out whether the former has taken on anything of this notable combination of colour. But of course such a comparison is not really practicable. There has been constant intermixture of blood between the two, during all this period of a thousand years; still, the amalgamation is very far from being complete.

I published, in my "Races of Britain," the figures for the upper and lower classes respectively of Dublin and Cork: the difference between them is considerable, but may not be altogether an affair of race.

What we really can do is to institute a comparison between the bearers of indigenous and those of exotic surnames. Of course the utmost one would be entitled to assert of the latter is that they have some exotic blood in their ancestry, whereas there is no evidence that the others have any such admixture. Even that would be too much to assert in every case, as we know that some Irishmen, especially within the pale, did adopt, in accordance with the law, surnames of English form. Still, I am disposed to think too much has been made of this, though such names as Fox and Harrington are said to owe their frequency to this kind of translation.

I have given a wide extent, in making the division, to the limits of the exotic class, including in it such names as MacAuliffe and Cottar, (= McOtter) together with those patronymics in Mac which are undoubtedly and exclusively Scotch, though of course a good case might be made for placing them otherwise, on the ground of race. With these come also the Anglo-Norman surnames, such as Fitzgerald and Power, though it may very well be that some bearers of these names are simply descended from Celtic clansmen of these families. A few doubtful or inscrutable names I have put aside altogether.

I have taken my material from several different years of the files of the "Police Gazette," in which are published nominal lists of deserters from the army, navy and marines. The medical officers of the recruiting staff differ of course in their appreciation of colour, like the rest of us; but as they do not hold office more than five years, it is easy to arrange the personal equation by taking several years at some distance of time from each other. The alleged birthplace is given in every case; and I take all the natives of Ireland of twenty years of age and upwards, and divide them into the two categories. The indigenous are more numerous than the exotic in the proportion of about five to three; in Ireland generally I think the proportion would be a little larger, as enlistment goes on more freely in some districts such as Dublin, Belfast and Cork, where exotic surnames, and probably exotic strains of blood, more abound.

Observation of Eyes and Hair.

It may be well to say something about methods of observation. With regard to the hair, there is on the whole more disagreement than as to the eyes, though one might have expected it to be otherwise. The recruiting officers use much the same divisions

as I do, and which Topinard has adopted—red, fair or light, brown (also called chestnut, neutral or medium), dark brown and black. Different observers give very different values to these terms, but by taking several years, the number of observers being thus very large, a sort of average is obtained. I find that my own index of nigrescence is a little higher than this average would give, for in hasty observations one naturally extends too widely the limits of the black and dark brown classes.

There are two methods of observing iris-colour, and several of classifying the results. The eye may be inspected closely and minutely, as Bertillon does for purposes of identification, so that the striae and central areola are distinctly seen. This almost necessitates an elaborate classification, as intermediate and mixed hues, neither blue nor light grey nor brown, appear very numerous and varied. The other plan is to regard the eye from a distance of three feet at least, and register the general shade of the iris, whether light, neutral or medium, or dark. Topinard improves on this, my original plan, by dividing the light eyes into blue and not blue, so as to give a point of comparison with Virchow's division into blue, grey, and brown. Virchow's grey is probably equivalent to Topinard's medium plus his light-not-blue.

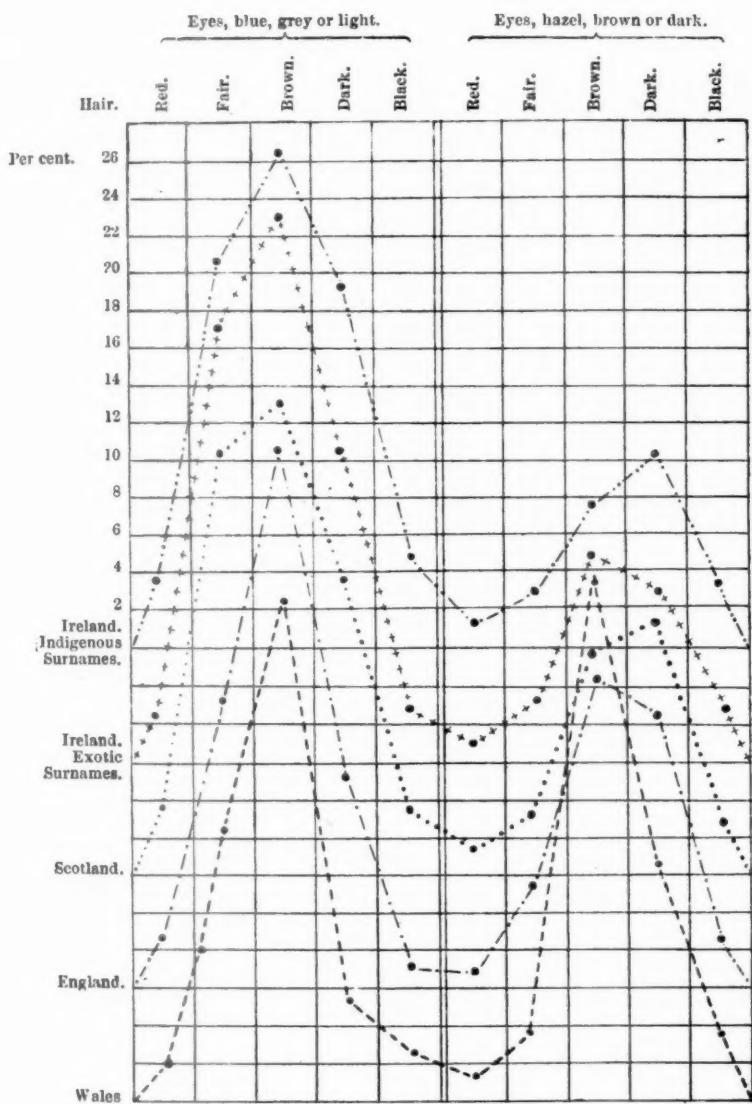
Our recruiting officers follow the second and easier plan. They seldom use any terms except blue, grey, light, hazel, brown, and dark. The first three fall naturally to be classed as light, the last three as dark, thus getting rid of the difficulty that some folk's blues are other folk's greys. The greens, dark greys, hazel greys, etc., which Topinard and I call medium-mixed or neutral, are divided summarily between the classes; many of them are called grey, some no doubt are called hazel, for not everybody grasps the obvious fact that hazel means a clear warm brown, like that of a nutshell. Hazel, by the way, is a rare colour in most parts of Ireland. On the whole, the recruiting results, thus classified, run very uniformly, English returns giving usually somewhere about 40 per cent. of dark eyes, Irish ones below 30, Scotch about 30, and the North of England a less proportion than the South.

I have tabulated the colours of 1,250 natives of Ireland bearing indigenous names, and 800 bearing exotic ones. The results are in the accompanying table.

They are not exactly what might have been anticipated. They are not, that is to say, what ought to result, in the case of the exotics, from the union of an equal proportion of indigenae and of mixed Englishmen and Scotchmen, or indeed from any mixture of that sort, whatever the proportions. The exotics come out altogether too light-complexioned. Their index of

COLOUR OF EYES AND HAIR, FROM ARMY, NAVY AND MILITIA REPORTS.

NATIVES OF	Number.	Sex.	LIGHT EYES.					DARK EYES.					TOTALS OF HAIR.					INDEX OF NIGRESCENCE.		
			Hair.					Hair.					TOTALS OF HAIR.							
			Red.	Fair.	Brown.	Dark.	Black.	Total.	Red.	Fair.	Brown.	Dark.	Black.	Total.	Red.	Fair.	Brown.		Dark.	Black.
Ireland—																				
Indigenous names ..	1250	m	3.6	20.6	26.4	19.3	4.5	74.4	1.3	2.9	7.9	10.2	3.1	25.4	4.9	23.5	34.3	29.5	7.6	16.3
Exotic names ..	800	m	2.4	22.9	29.1	16.2	2.8	73.4	1.4	3.4	10.2	8.7	2.7	26.4	3.8	26.3	39.3	24.9	5.5	5.8
Scotland ..	1000	m	3.5	22.2	25.	15.8	3.4	68.2	1.2	3	11.8	13.2	2.6	31.8	4.7	25.2	36.8	29	6	7.7
England and Wales ..	1000	m	2.6	17	28.5	11.2	1	60.3	.9	5.6	16.5	14.3	2.6	39.7	3.5	22.6	45	25.5	3.6	6.6



nigrescence is not only much lower than that of the dark indigenæ, but somewhat lower than that of either the Scots or the English. The influence of the Scottish element may be shown, perhaps, to some extent in the frequency of light hair, and that of the English in the reduced frequency of the combination of light eyes and dark hair, and the increase of the converse one of dark eyes and light hair. But on the whole the most striking result is, that the descendants of the colonists, with an Irish cross, have acquired the light eyes proper to the country, but not the dark hair.

More than one possible explanation of this fact occurs to me, but I will put forward but one of them. It is this, that in the crossing of different types a certain condition of instability is produced, which allows an opportunity for the play of those influences of media which are powerless, unless through the influence of natural selection, to affect established breeds. The climate of Ireland, speaking roughly, is comparatively cool, damp, and sunless. These are precisely the climatic conditions which are supposed to be favourable to blonds. But whereas the original Atlantean Irishman was dark, his descendants have remained so, in spite of climatic influences, until those influences have had freer play allowed them through crossing with alien blood, Galatic, Scandinavian, or Saxon.

COPPER and BRONZE in CYPRUS and SOUTH-EAST EUROPE.

By J. L. MYRES, M.A., F.S.A., F.R.G.S.

[WITH PLATE XI.]

THE moment of the introduction of metallurgy is, in the history of any civilisation, a crisis second only in importance to the introduction of fire. It is consequently a question of fundamental importance in the study of mankind in Europe, how, when, and whence copper, bronze, and iron first came into common use.

Obviously the first question is to determine *where* copper is found within the limits, and in the immediate neighbourhood of Europe? And for our present purpose it is enough to note that Britain, possibly Scandinavia, Spain, Central Germany, and Austria-Hungary, the Urals, Greece (especially Chalcis in Euboea), Cilicia, and Sinai, are, besides Cyprus, the only sources which need be considered; and that of these the first three, and the Russian and Greek areas, may be safely discarded as derivative.

The Bronze Age strictly must now be divided, almost wherever it can be discussed at all, into the age of pure, or nearly pure copper, and the subsequent age of copper united with tin in a tougher and more serviceable alloy.

This brings up of course the whole tin question, which goes beyond the limits of the present inquiry; it is enough to note that tin is found in the neighbourhood of copper in Britain, Spain, and parts of the Central European area; and that it is *not* found in Cilicia, Cyprus, in Sinai, or Mesopotamia.

The older statements that there is tin in Crete are anticipations, by three centuries, of discoveries which still remain to be made.

The purpose of this paper is to examine the question whether Cyprus, which probably from the time of the XIIth, and certainly from that of the XVIIIth Egyptian Dynasty, to the collapse of the Roman Empire, supplied the coasts of the Levant with copper almost to the exclusion of any other supply, and gave its name to the metal in the Roman and so in the modern world; may not have even been the first centre of copper working within the area in question; may not, that is, have imparted to Asia and to Europe, if not also to Northern Africa, the first knowledge of the first metallurgy.

We should note, to begin with, that in Cyprus, where the rich copper ores lie near and even on the surface; where until

Roman times at least the interior was densely forested; and where, as everywhere in the Levant, forest fires are of annual occurrence and great intensity, we have a very likely area for the accidental reduction of the metal in the manner suggested of old by Lucretius.

Also, that in the absence of native copper, smelting of some kind must have been resorted to from the beginning; and that in fact all the early Cypriote weapons, and all which come here under review, have been cast in a mould; though they have often been hardened by subsequent hammering.

The evidence which seems to lead to the conclusion that the Cypriote copper was the first worked in the Mediterranean area is of several kinds.

Firstly. The Stone Age is apparently not represented in Cyprus as a distinct period of long duration. Only one instance has occurred hitherto in which the date of an implement can be ascertained from the objects which accompany it, and in this instance the circumstances indicate a late period of the Bronze Age. The second of the five instances which are known,¹ comes from the same neighbourhood, and so far as the inadequate record of the discovery goes, probably from the same necropolis. The other two finds were both of casual occurrence. Further there is nothing to show that the two Neolithic implements already cited are of distinctly late or abnormal type.

We may, therefore, infer that the Copper Age in Cyprus was in part, at least, contemporary with the later Stone Age elsewhere. On the other hand the copper celts of Cyprus long retain the quite primitive unflanged form,² which is certainly suggested by a Neolithic prototype. This looks as if they had long co-existed with Neolithic celts elsewhere; and consequently as if no commercial incentive had existed to modify and perfect their form.

Here comes in a further piece of evidence, namely, a polished celt³ in the Ashmolean Museum (probably from Melos), the general form, the flat sides, and nearly rectangular cross section of which seem to indicate that it has been definitely fashioned in imitation of a copper celt of the Cypriote type.

Secondly. The Cypriote types of celt and dagger blade certainly determine the types which prevail on the Syrian coast down to the Mykenæan Age, and, not improbably, even later. Further, the excavations of Dr. Bliss at Tell-el-Hesi⁴ in the Philistine country, and of Dr. von Luschan at Sinjirli in North Syria have established the fact that the Syrian coast is very largely indebted to Cyprus, within the same early limits, for

¹ "Cyprus Museum Catalogue," 1897, p. 13.

² Plate XI, 1.

³ Plate XI, 2.

⁴ Plate XI, 3.

much of its fine pottery. Several classes of vases, in fact which may now be stated with certainty to be Cypriote, are found not infrequently on the mainland sites. And if such articles of luxury were being exported from Cyprus, *à fortiori* the copper, which abounds in Cyprus, and is, apparently, absent on the mainland opposite, must have been exported; in fact, the trade in copper probably determined the trade in vases.

Nor is this class of evidence confined to the Syrian coast. Cypriote vases have been found exported to Egypt, and are represented also by casual finds in the Cyrenaica, in the island of Thera, and in South Italy;¹ and by dated groups at Athens, and at Hissarlik. These dated groups all belong, it is true, to the *later* Bronze Age, though that from Thera is almost certainly pre-Mykenæan.

With regard to Egypt the dated evidence takes us rather further back. I have found at Kalopsida² in Cypriote Bronze Age tombs of not very early date, and associated with copper implements of not very early type, a most characteristic class of small black clay vases with punctured ornament, which are well-known in Egypt on the sites of foreign settlements of XIIth Dynasty date, but disappear wholly before the foreign settlements under the XVIIIth Dynasty.

This find seems to carry back the existence of copper working in Cyprus and the probability of copper exportation from Cyprus, at least as far as the twentieth century B.C. (on the current Egyptian reckoning) and the inference is confirmed by the fact that all the native porcelain beads of Cyprus at Kalopsida, Agia Paraskevi and on other sites, are imitations of a characteristic XIIth Dynasty fabric, even if they are not themselves, in some cases, of Egyptian manufacture.

Thirdly. The collateral argument from the pottery may be carried a stage further back, though not exactly in the same form. The characteristic forms of the earliest pottery in Cyprus are mainly derived from gourd vessels;³ and the mellow colour of a well-used gourd is imitated by a slip of bright red clay, hand-polished to a lustrous surface; the characteristic ornament, again adapted from that of gourds, consists of varied groups of incised lines, and these lines were emphasised and preserved by filling them with a white chalky substance; often with gypsum, which is very common and accessible in the parts of Cyprus where these fabrics are found.

This polished red ware⁴ is found in all the Bronze Age sites in Cyprus, except in one or two, which are rude and perhaps really

¹ "Cyprus Museum Catalogue," pp. 19, 37, 39.

² "Journal of Hellenic Studies," xvii. pp. 138-147.

³ Ohnefalsch-Richter, "Kypros," Plates XXXIV-V.

⁴ Plate XI, 4.

Neolithic, though no stone implements have been found on them as yet; it comes to perfection almost at one step, and passes through a long period of magnificence to an even longer period of decadence; and its offshoots exist even at the present day.

In Cyprus this pottery antedates the actual appearance of copper and *may* of course have nothing whatever to do with it; also, as it is very fragile, it is not likely that it was ever exported wholesale; nor are specimens of it known from abroad.

It is therefore most noteworthy that at Hissarlik, where the lowest stratum contains only black glazed pottery, and only very rare copper implements (and of these some are of late forms and are almost certainly admixtures from higher strata), there comes in, in the second stratum, and associated with numerous copper weapons of Cypriote type, a polished red ware with incised and white filled ornament;¹ its forms, however, are imitated only partly from Cypriote forms and partly from the native forms of the first stratum: in particular they lose sight by degrees of their gourd prototypes, just as one would expect if our hypothesis be valid, and they have really nearly reached the border of gourd-land. In the same way, and presumably for the same reason, the ornament is distinctly poorer in conception and in execution, and is contaminated with local and non-Cypriote motives.

A similar red fabric of pottery is found on pre-Mykenæan sites in Crete and Thera, at Athens and other places in Greece, as well as in pre-Mykenæan Malta and Sicily; and can be traced beyond the Dardanelles, and as far as Hungary and Transylvania, and a last reminiscence of it even in the Swiss lake dwellings. And the incised and white filled ornament has been long and fully recognized as characteristic of the pottery of the earliest Bronze Age in Central Europe.²

So far as I am aware, however, no actually Cypriote specimens of the red polished ware have been detected either at Hissarlik or in Europe. This may be because they have not been looked for, but the case is all the stronger if they are absent.

The coincidence of motive is so close—amounting as it does to practical identity—that independent invention is really out of the question, especially where there is so strong an *à priori* case for communication one way or the other between the two areas. And the incomparable superiority of the Cypriote work, coupled with its closer adherence to the archetypal gourd forms, makes it practically certain that the fabric and its motives were propagated from Cyprus north-westwards.

¹ Plate XI, 5.

² Plate XI, 6.

But pots so fragile can hardly have been the sole object (even if they were the object at all) of commerce over such distances, especially considering the very *local* character of all early pottery; for the case of the red polished ware, which is a domestic fabric both in Cyprus and Hissarlik II-III, is quite different from that of the leather-type vases already mentioned as probably Cypriote and as found on the coasts of the Levant.

But if the pots themselves were not exported, the knowledge of them must have travelled by other means. The only other means conceivable is that commerce existed between Cyprus and Hissarlik, and so with South-east Europe. And the only conceivable object of commerce is the copper, the staple product of Cyprus, and the preparation of which presumes so close an acquaintance with the manipulation of clay.

We may compare the close association of nascent bronze industry at a later stage with nascent ceramic at Chalcis, at Corinth, and in Etruria.

Fourthly. Further evidence arises from the forms of the implements themselves. The Cypriote forms remain few and simple, the celts in particular showing very little change throughout the series. It is true that ruder and more stone celt-like implements are occasionally found on European, especially on Danubian sites, than any specimens from Cyprus, but they are not therefore necessarily prior in time to the Cypriote forms.

The fact, that the Cypriote forms develop so little, may on the other hand be very well due to the abundance of the metal and to the scarcity of tin, without which the tougher alloy cannot be made, which permits of the slighter built and more elaborate forms of the North. The total absence in fact of these more elaborate forms, and the late date at which tin-bronze becomes common in Cyprus, is strongly against any hypothesis that Cyprus was indebted to the North for its knowledge of copper.

Compare also with the absence of Northern types, and the late arrival of tin, the late arrival of amber in Cyprus. It does not appear until the end of the Mykenæan Age, and is usually associated with glass beads of types which are common or indigenous in Italy, and at the head of the Adriatic. The earliest example is found in a very late Mykenæan tomb (*Salamis (Enkomi)*, 1896, 27, amber bead, Cyprus Museum Cat. p. 184, cf. 139).

Meanwhile, Cyprus does show rare examples of intermediate steps towards European forms, which appear to be wanting in the North. The prototype of the hammer-adze is represented by an ordinary flat celt, with an oval hole punched through the

Don't what did C bring back from N.

hinder end,¹ and the double adze and axe-and-adze compound types by two such implements welded together.² Here the superposition of the two halves explains the dislocated position of the two blades which is found in the European examples, though the latter are usually cast in one piece.

The introduction of copper into Europe was closely followed by the establishment of independent copper fabrics; which like the Cypriote go back to Neolithic prototypes, and are themselves imitated in stone.

Though these are properly bounded to the southward by the Balkan barrier, specimens of them are sporadically found further south; for example, an axe-and-adze of Danubian type now in the Ashmolean Museum,³ bought at Phigalia, and so strange to classical archæology as to be reckoned mediæval by its discoverer. Such implements occur rarely at Hissarlik, but have not been traced further south on the Asiatic side.

That the communication between Cyprus and Hissarlik was overland is indicated, in default of better, by three pieces of indirect evidence.

(1) If the communication had been by sea, Cypriote types would have been spread over the Ægean and over Greece. The imperfect state of the evidence does not permit of a definite statement; but so far as I am aware, Cypriote types of implements do not occur in the Upper Ægean, where on the other hand Neolithic implements are comparatively frequent.

The Melian stone-celt, and the pre-Mykenæan copper implements of Amorgos indicate some connection further south; but in Amorgos the types are all secondary, and have developed along a distinct line, shared by those of Crete.

They are also apparently of much later date; for they are more elaborate and specialised in form and are associated with *painted* pottery with naturalistic and curvilinear ornament. The Mykenæan bronze implements are either derived from the Amorgine, or more akin to northern bronze types: while Crete borrows adzes independently from Egyptian—probably Sinaitic—forms of the XIIth dynasty and onwards.

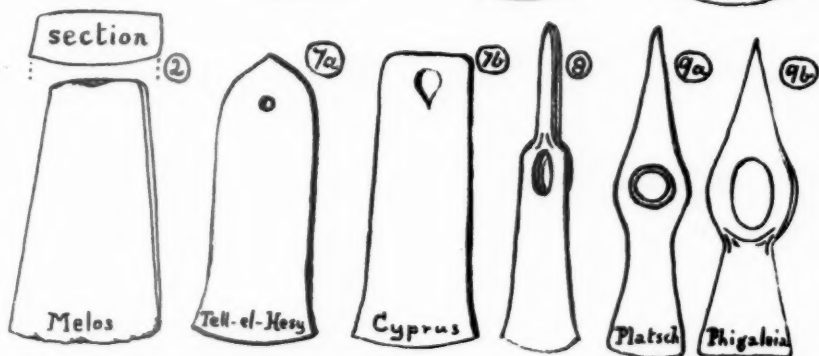
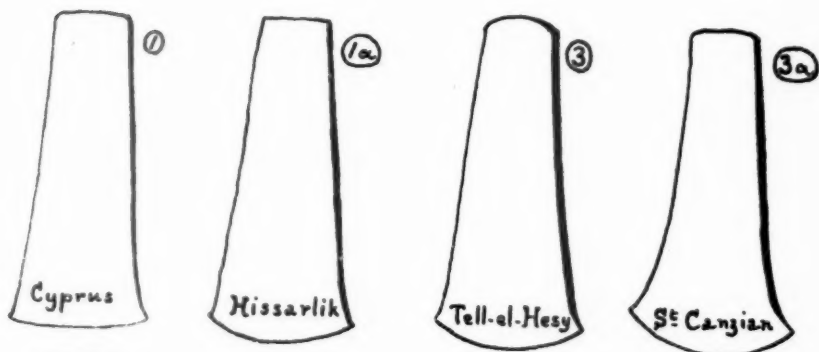
(2) If Cyprus had reached the Dardanelles by sea, nothing need have passed by Hissarlik at all—whereas the whole *raison d'être* of Hissarlik is as a station commanding the Dardanelles ferry; and combining in its peculiar type of civilisation elements borrowed almost impartially from Europe and from Asia. This alone explains the mixture of Cypriote and Danubian forms of pottery and of implements, and also the large proportion of *bronze* implements among the copper ones.

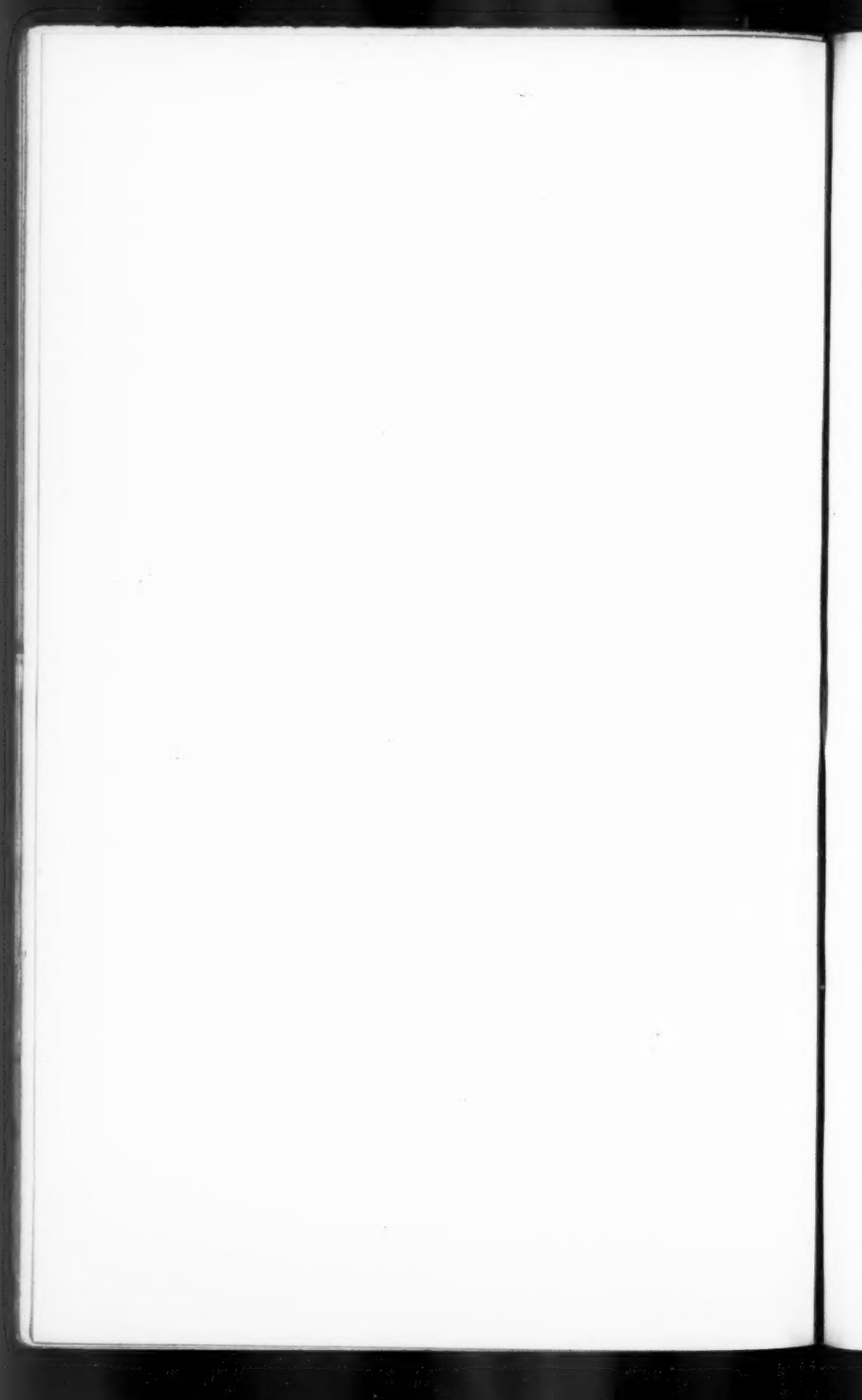
(3) We have a really historical, though unfortunately undated

¹ Plate XI, 7.

² Plate XI, 8.

³ Plate XI, 9.





reference to the existence of this land route, at least as early as Mykenæan times, in the Catalogue of Trojan allies in the Second Book of the "Iliad."

They are arranged in three series, each in geographical order radiating outwards from Troy. The first, after giving the immediate neighbours of Troy in the Troad, passes into Europe by Lesbos and Abydos, and traverses in turn the Pelasgians, the Kikones, the Thracians, and the Pæonians; that is, it follows the straight road along the north shore of the Ægean Sea; thence through Upper Macedon, into the Morawa Valley; and so to the Danube.

The second, starting westwards and omitting Bithynia which represents the Thracian incursions of the eighth century, passes through Paphlagonia and ends in Armenia and Pontus; "from afar out of Alybè, where is the birthplace of silver."¹ Compare with this hint, as helping to fix the date, the wealth of silver plate in the Great Treasure at Hissarlik.

The third passes southward, *vid* Mysia, Mæonia (that is Lydia) Karia, and ends in Lykia. We can hardly doubt that it went further; skirting the central plateau of Asia Minor through Pisidia and through Cilicia, and that its goal was Cyprus, the copper island.

¹ Hom. "Il." ii. 857.

TEXTILE IMPRESSIONS *on an* EARLY CLAY VESSEL *from* AMORGOS.
By JOHN L. MYRES, M.A., F.S.A., F.R.G.S.

[WITH PLATE XII.]

THE fragment of pottery which is the subject of this note and of Plate XII was picked up by me in the summer of 1893, together with a number of others of no special interest, on the surface of the site of a Bronze Age settlement which lies on the north side of the Harbour Bay in the Greek island of Amorgos, and a few minutes' walk from the sea. The site is known as *τῆς Βίγλης* (pronounced *the Vigles*), and is mentioned, among a number of other Bronze Age sites, by Dr. P. Dümmler,¹ who visited Amorgos and excavated there in 1886.

The site consists of a low mound rising in an uneven cornfield and only just too prominent to have escaped being wholly ploughed down. Indeed, its lower part has been a good deal degraded, leaving the summit rather steeper than it might otherwise have been. All over the undisturbed parts traces of very rude dry-stone walls are visible, of the same character as those on the conspicuous hill on the south side of the bay above the modern harbour village, and elsewhere in the island.

The whole site is strewn with fragments of pottery, all, so far as I could see, of the same local clay, and of very coarse hand-made fabric, usually covered with a dark red, lustrous slip of rather finer clay, which shows distinct signs of hand-polishing, but without further ornament. Dr. Dümmler has described a number of examples from the Bronze Age tombs of Amorgos of pottery of light-coloured clay with ornaments in lustreless umber paint; but I found no fragments of this kind at *τῆς Βίγλης*.

The fragment reproduced in Plate XII formed part of the base and the lower part of the side of a large, capacious vessel of coarse clay, full of fragments of micaceous schist, calcined felspar, and other minerals.

The clay is burnt to a bright brick-red, slightly paler in the centre; the layer of slip is thin, fine, and of a rather darker red; the base and walls of the vessel are from $\frac{3}{8}$ inch to $\frac{5}{8}$ inch thick (.010—.015 m.).

The sides join the base outside at a distinct angle of about 125°, but pass into it by a gentle curve internally; the base

¹ *Mitth. d. K. Deutschen Institut's (Athenische Abtheilung) xi.* (1886).

appears, on a cross fracture, to have been laid down as a flat cake first, and the sides to have been built up upon this.

The remarkable feature is that the base bears the clear impression externally of a rush mat, upon which the vessel has been formed. The mat is of simple construction: from a confused knot in the centre emerges a radial "warp," so to speak, of rushes in pairs; the "woof," also of pairs of rushes, is woven round and round the centre in simple alternating texture. The rushes of the warp have not kept their strictly radial position in the parts further from the centre, but have been drawn to the right (left on the impression), showing that, either in the weaving or subsequently, a wrench or circumferential strain has been applied to the mat, in the direction of the hands of a watch. The mat apparently ends without distinct rim or binding, and is of about the same diameter as the base of the vessel; but the impressions are not quite concentric with the base.

There are no traces of impressions on the sides of the pot, or upon the angle itself, so that it is clear that the mat did not serve as a mould for the vessel, but merely as its support.

So far as I am aware, this is the only example of basket-work impressed upon pottery in this way either from Amorgos, or from any other part of the Mediterranean area. Mr. W. H. Holmes has made us familiar with the customary use of textile ornamentation upon the pottery of the North American mound-builders; but though schemes and motives of ornament derived from textiles are as common in the Old World as in the New, the actual impressions do not seem to have been in vogue anywhere except in America.

In this instance, too, the motive of the impressions can hardly have been decorative, as they appear only on the base, which would be concealed when the vessel was in use. It appears probable therefore that the mat thus recorded was used either (1) to prevent the vessel from sticking to the ground, while drying or in the kiln, or else (2) during the actual manufacture of the vessel. The former (1) is less likely, as a layer of unwoven rushes would have served at the drying stage, and in the kiln the charred fibres would almost certainly have left stains on the vessel, which are actually absent. On the other hand (2), small vessels can be handled upon a level surface without much fear of distortion; but a jar of the size of this specimen, with a base of some 10 inches (·25 m.) diameter and walls of considerable thickness, would certainly be so heavy that it could not be turned round, at the convenience of the potter, without great risk of distortion.

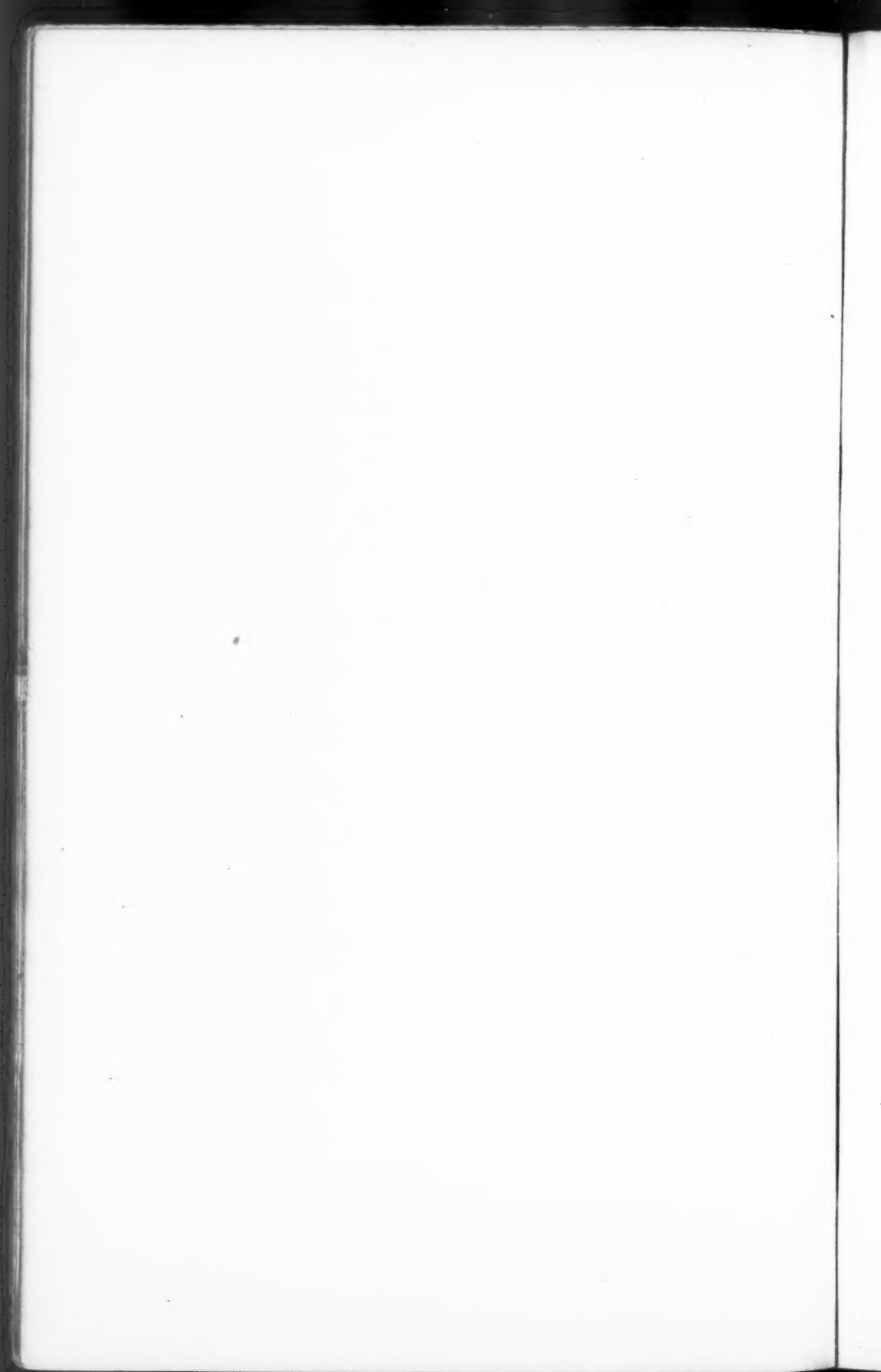
If, however, its foundation were laid on a circular mat of the size

of the intended base, and with a slightly thicker knot in the centre, as in this instance, close or continuous contact with the ground would be avoided, and the central pivot would to some degree supply the place of a turn-table or potter's wheel. If this mat and the vessel upon it had been subjected to manipulation of this kind, the lateral bending of the radial rushes, already described as due to a circumferential strain, would also be very completely accounted for.

The specimen has been presented to the Ashmolean Museum, Oxford, and a cast of the impressions to the Pitt-Rivers Museum.



POTTERY FROM AMORGOS, WITH IMPRESSIONS OF BASKET-WORK



DUK DUK *and other* CUSTOMS *as forms of* EXPRESSION *of the*
MELANESIANS' INTELLECTUAL LIFE. By GRAF V. PFEIL.

WHEN after a lengthy intercourse with the Kanaka of that part of Melanesia which to-day we call the Bismarck Archipelago, the European has learned to some extent to know and to understand the habits of the natives among whom he lives, he is particularly struck by one feature which is so prominent that in a great measure it forms the key-note of that very peculiar composition which we call the native character. It is the strongly apparent desire towards physical and psychical seclusion. Where the native has been left entirely, or nearly so, to himself; where he has not been obliged to yield to the European's coercive influence, he will try his utmost to confine his intercourse to his own family and to the very next villages, with whose inhabitants he is probably connected by ties of blood. Any person from a village removed beyond the small district which the Kanaka looks upon as his home he considers a stranger, and consequently an enemy. This feeling might be justified if extended towards the intruding white man, but is difficult to understand when entertained towards nearly all individuals of the same race, provided the distance which separates their respective villages exceed that which can be accomplished in an easy ramble. It is difficult to say whether fear is the *root* of this strange disposition, or whether the continued practice of seclusion has bred up in the Kanaka that constant suspicious fear which never for a minute permits him to lose control over himself. It is probable that both tendencies are innate to the Kanaka, and that his character as we now observe it is merely the result of their combined effect prolonged through ages.

We can clearly distinguish a psychical and physical direction in this tendency towards seclusion, the extreme end of each being strongly marked. More difficult would it be to trace the line from which these two branches take their departure.

The Kanaka who is not yet influenced by civilisation hates strangers, in whom he sees only enemies. No wonder he tries to have as little communication with them as possible. The habit of cannibalism, which is still practised to a great extent in this part of the world, may be explained as an emphasis on their abhorrence of the stranger, whom they wish to exterminate. This habit may also be considered the extreme point of physical seclusion. Towards the black it is still kept up in its aggressive

form, in so far that no Kanaka may, without risk of life, attempt to visit the district of a tribe with which his own is not on distinctly friendly terms. Before the power of the white man had become sufficiently established, that aggressive inclination was also directed against him, and many white men became its victims. Since the Kanaka has been taught that the white intruder becomes the more disagreeable the more he is repulsed, he has contented himself with bearing his presence as a necessary evil, which presents as extenuating circumstance the introduction of a number of articles which, though not strictly necessary in themselves, are yet agreeable additions to life's comfort. If thus we may consider that, so far as our influence reaches, we have in some measure at least been able to diminish the Kanaka's physical seclusion, we must confess that it has up till now been perfectly impossible to remove the barrier which he has erected between his inner self and those who surround him. How little progress we have made in this direction may be gleaned from the fact that, in spite of the strong materialistic tendency of the Kanaka, we have not yet been able to teach him to look upon any of the productions of our manufacturing industry as a necessity. He likes our hatchets, our *lavalava*, wire, etc. He would, however, gladly dispense with any of those articles, even with matches, if through this sacrifice he could rid himself of the presence of the hated white man. There is only one thing the loss of which would draw a tear from the shallow well of his eyes—American tobacco. Alcohol and sugar possess no allurements for him; only the narcotic weed seems to possess the charm to soothe the savage Kanaka's breast. We have many instances to prove this. If we look at other parts of the world which have only been opened to trade within memory of man we find that clothing of some sort has been adopted by the savages, if not from want of it or from a sense of decency, so at least from a desire of ornament. In the Archipelago we compel the native to cover his nakedness, and force him, in a way, to become the purchaser of our cotton manufactures. When we visit him in his village on the coast, or among the mountains, we find that he has put his loin-cloth aside and resumed his accustomed nakedness. When labourers return to their homes they bring with them clothes, hatchets, and other goods they have received for the money due to them as wages. The boxes containing these articles are immediately plundered by the men's relatives or co-villagers: the articles are worn for a while as grotesque ornament, and then thrown aside, with exception of the hatchets, the superiority of which over the old stone or shell tool has become generally known and acknowledged.

This fact, that our trading goods have not been able to fetter the Kanaka's avarice further than they have, may be looked upon as a proof of both the physical and psychical seclusion, in so far, as the desire to possess these goods has not led to a more general intercourse between the two races, which in its turn might lead to a better mutual understanding. I have alluded to the difficulty we find in pointing to the spot where the physical and psychical branches of the Kanaka's desire for seclusion part asunder, but have always thought that this peculiar passive resistance to a new shape of wealth was a good markstone between the two extremes, one of which, as we have seen, finds its expression in the disgusting habit of cannibalism. As a further illustration of the extent to which the Kanaka carries his physical seclusion, I may state that that part of the Gazelle-peninsula which is known to us, though only thinly peopled, is divided in no less than twenty districts, in each of which another dialect of the same language is spoken, all of which differ so much that, while the inhabitants of two neighbouring districts may still converse together, those of localities further removed from each other have difficulty in making themselves understood when they happen to meet.

Far more difficult to define, but also more interesting to study, is the Kanaka's psychical seclusion. It might be argued that the racial differences are so great that a real understanding between the Kanaka and the European cannot be arrived at. If that were the case, the character of the African negro would or ought to remain as unintelligible to us as that of the Kanaka. We find, however, that we can easily read the negro when once we have gained his confidence, which the Kanaka seems entirely unable to bestow. His distrust, suspicion, and fear is not alone directed towards the white, but also against his own kindred; and the loud, joyous communicativeness which is an agreeable distinguishing feature in the negro character, is utterly wanting in that of the Kanaka. Their councils are held in the darkest, remotest part of the forest; and even here their conversation is carried on in an undertone, and suspended the instant a newcomer appears. Their festivities, though noisy enough, are void of the sound of genuine mirth; and innate fear of some dark, ever-present, invisible danger never permits the Kanaka to lose control over himself for one instant, or to yield to the promptings of softer emotions, which he has perhaps long forgotten to harbour. His untutored mind is unable to give shape to his sinister apprehension, or, better, to reason that supposed danger out of existence; and his imagination, always more active than his reflection, fills the world with invisible beings gifted with the power and the will to do him harm.

His materialistic turn of mind interprets all supposed actions of the spirits as the expression of a desire to be fulfilled by him; and as he is unable to distinguish between cause and effect, nearly every event of which the origin is not at once apparent, is attributed to the agency of a spirit, and looked upon as a communication from them. He hears their voice in the sough of the wind, in the thundering breakers of the sea, in the rustling of the falling leaf; and the frequent shocks of earthquake, which indicate the ever diminishing throes of Nature's mightiest manifestation, are to him but expressions of discontent of some aggressively-inclined spirits. These require continual propitiation, not that they may do good, but that they may leave evil undone. When a Kanaka hears a noise he cannot at once interpret, he knows that a spirit is passing by. Looking in his supposed direction he says "*Ukakup*," "Are you bringing anything?" This expression conveys at the same time an invitation to stay and to partake of what is going to be brought or what may already be present. His imagination deceives him into hearing an answer—"Maie," "Yes, indeed"; upon which he replies "*Ule*," "Come." We cannot wonder, after the foregoing, when we discover the endeavour on part of the Kanaka to surround most of his actions with a degree of secrecy, and when we find that he possesses customs shrouded in a mysteriousness which the Kanaka himself can or will not explain, and which must remain totally unintelligible to the European. One of these customs which the visitor in these parts often finds an opportunity to witness, and of which a part has often been described, is the *Duk Duk*. It is well known as a masked dance; but to my knowledge the various ramifications of this peculiar institution, together with the *Eineth* and *Marawot*, have not yet found very careful attention. We may not be far wrong if we assume that in the beginning the *Duk Duk* ceremony was nothing but another expression of the Kanaka's seclusive inclinations and of the worship of deceased ancestors. A few persons clubbed together and assumed a mask to frighten others from entering their territory and witnessing their proceedings. When there were no more strangers to frighten, the club members found that their affected secrecy tended to inspire awe into the members of their own family and tribe, which perhaps had grown numerous enough to permit a renewed seclusion, in so far as only certain individuals were allowed to become members of the club. The awe which the club inspired probably invested its members with a degree of authority which came to be coveted, so that applications for admission became frequent. The strong materialistic instinct of the Kanaka was not slow to turn this fact to account, and

admission was only granted to those who could afford to pay handsomely for the privilege. When once it was discovered that the club might be made a source of emolument, it would be deeply wronging the Kanaka character to think that he would have confined himself to the collecting of the comparatively small entrance fee of new members when new and effective methods could be devised by which every member of the club might draw a comfortable little income without being under the unpleasant necessity of doing more work than is absolutely indispensable, even for the laziest Kanaka.

Only men were admitted into the club, and it was thus easy to blackmail the women of the tribe, who, by the customs of the people, enjoy full possession of their own earnings. Being harder workers than the men they soon acquire property; and as there is no legitimate way of turning this stream of increasing prosperity into the men's pockets, the Duk Duk offers a very good means of preventing unfair accumulation of wealth in the hands of the women. To increase the club's authority and give effect to its blackmailing system it had to be shrouded with a new veil of mystic ceremonies. Women were thus forbidden to come anywhere near the spot where the Duk Duk members assemble. If an unfortunate woman happened to see the Duk Duk, *i.e.* the wearers of the mask, she was fined a certain quantity of *dewarra*. At all times the Duk Duk would suddenly appear, mostly, however, during the harvest season, because then the women had to be at work in the fields, and going to and fro, and they were then also mostly well supplied with *dewarra*, the proceeds of the sale of their agricultural productions. It would have been a source of grave suspicion had the blackmail system been directed against women only. To extend it also over men became easy enough, when the tribe had grown so numerous that not all the men could be members of the club, or when the members had so increased in number that new admissions would have unpleasantly reduced their income. Perhaps the natural seclusive tendency also came into play again. Thus also men, not members, were made tributary; but as it proved more difficult to wrest *dewarra* from them they were let off with a series of blows which, however well laid on, were nothing compared to the loss of even a small quantity of the worshipped shell coin. Thus in combining the effects of the Kanaka's natural bent for physical and intellectual solitude and his strong materialistic disposition, we explain easily the two Duk Duk characteristics, which at once strike the beholder—the fear of the women and the beating of the men.

It is but natural that when once the Duk Duk had gained a

certain amount of influence or even power, some individuals, in the first instance probably members of the Duk Duk, afterwards also not members, should have tried to make that power subservient to their own interests. At first the Duk Duk blackmailed those who were enemies to members of the club; later on those whose enemies paid for having them robbed, and gradually the Duk Duk assumed the character of a tribunal, not in the sense that by his verdict he had to establish right and wrong, but as a power with sufficient influence to enjoin peace on contending parties.

If thus the Duk Duk had gradually risen into a position which it required tact and shrewdness to maintain, it became evident that not every member could be allowed to wield its power indiscriminately in his own interest. It became necessary to place that influence into one hand, which, though perhaps corrupt, upheld at least the prestige of the club. It was not necessarily, but most likely, the inventor of the club or his descendant who was invested with the prerogative to call out the Duk Duk, a privilege which he succeeded in reserving for himself and his descendants after him. To-day only certain individuals are entitled to calling the Duk Duk, and we have thus amongst a perfectly savage race a peculiar instance of protection of intellectual property and of a well accentuated entail.

The Duk Duk, which appears with a certain regularity but only with the full moon, skips about for three days, while the lifetime of the Duk Duk which has been called up on a special occasion seems to be limited to a few hours.

Apart from the utilitarian purposes which the Duk Duk has to serve, it is the means of satisfying the metaphysical desire which, as we have seen, is so strongly developed in the Kanaka. The members of the Duk Duk celebrate certain feasts of very mysterious character, and it is not yet quite clear how they are connected with the Duk Duk, how they originated, and what they portend. One of these feasts, though in some way connected with the Duk Duk, is quite an independent institution, and is called *Eineth*. At certain seasons in the year—the intervals seem to be irregular—a number of people, members of the Duk Duk, gather in a remote part of the forest at the call of the person who is entitled to call up the Duk Duk, and who is on this account called its owner.

In the dense bush they build huts, which they surround with a railing or fence of reeds so closely joined that it is difficult to peep through the chinks. The huts are built square, and the walls plastered with clay and whitewashed. On the

white ground of these walls the artist of the tribe paints most curious figures. One of them resembles a crocodile on high legs, with the tail rolled up like a hawser; the other reminds the European spectator of a monkey, a very striking circumstance and proof of a highly developed imagination on part of the Kanaka, because no monkey exists in that part of the world of which the Kanaka can possibly have any knowledge.

A third figure resembles the casuary, a bird with which the natives are familiar. On some of the largest trees outside of the fence other figures are drawn. One represents a stinging rayfish in the act of biting into a human arm. Some more arms and snakes are painted on another tree, and on a third we find two very curious shapeless figures, which represent two evil spirits: they are called *Turangan* and *Marengare*. Who and what these spirits are and what they do the Kanaka will not, or cannot, explain. They merely say that they are spirits of departed people. This is another of many proofs that the Kanakas believe in an existence after death, but would also prove again their sinister disposition, which leads them to think that even people whom they knew during their lifetime, with whom they were on friendly terms or even related, assume the shape of an enemy so soon as they leave their human friends and enter into the ranks of spirits. This fenced-in group of huts is accessible only to members of the Duk Duk. Anybody happening upon it unawares is fined heavily, and as a direction in which the "*Toraiu*" lies is well known, nobody ventures thither. The festivities celebrated here are of a very peculiar character. I do not think that any European would be admitted to a really important one, and only the members are informed of the day fixed for any festivity. I only once succeeded in bribing an influential man to procure admittance for me, and should possibly not have succeeded then had not my official position added weight to my *dewarra*-supported request. I feel convinced that even then I was only permitted to witness a minor affair. About twenty men squatted on the ground in a semicircle with their faces turned towards the painted houses. All were silent; and my guide, subduing his own voice to a whisper, enjoined silence on me. He then sat down before the other members with his back turned towards them. After a while a basket containing all kinds of victuals was placed before him, the leader of the feast. He rose murmuring a few incomprehensible words over the contents of the basket, and stepping towards the other men, who now also had risen, he held certain kinds of food up to the mouth and nose of each individual, accompanying the action with some more words in an inaudible voice. He then replaced the food

in the basket. When he had finished the round, the basket was taken away, and all the guests sat down again. The silent meeting was then continued for an indefinite period. From that moment, to each of those present that kind of food is rendered *tambu* (that is, forbidden) which had been held up to his mouth. The *tambu* lasts perhaps for a month, perhaps even a year, and it is not alone food which is thus *tambued*, but also other objects—certain actions, or even words. Thus it may be made *tambu* to wear a certain kind of ornament, to sleep inside a house, or to pronounce certain words or names. It is remarkable that the latter habit forms a curious parallel to the custom called *Alonipa* of the Zulus. During this period of *tambu* the participators are subject to a certain control. After certain irregular intervals—which seem to be connected with the phases of the moon—they meet again at the "*Torainu*," from which they march in a procession all round the neighbourhood. Without any kind of dress—instead of which they assume a grotesque war-paint—we discover in it the snake designs drawn on the trees before the "*Torainu*"—they walk in Indian file. Under the right armpit they wear a plaited mat bag, from which a reed with a bushy whisp projects upwards and backwards. After a certain number of steps they all simultaneously slap their naked thighs, producing a noise audible at some distance. The whole ceremony described as the *Eineth* cannot be explained upon the basis of the Kanaka's materialism; but if the people attach any special significance to the *Eineth*, which is doubtful, they can certainly not clearly define it. The great repugnance they show to giving any information, and the difficulty the European experiences to witness these ceremonies regularly, renders it no easy task to explain the origin of the custom. We can, however, not go very far wrong if we seek an explanation in the character of the Kanaka, in which fear and distrust are coupled with gross materialism. It is, therefore, not at all unlikely that, as the *Duk Duk* is a means of extracting material advantages from mankind, the *Eineth* is a method of propitiating the spirits to avert evil. Another most remarkable feast is the *Marawot*. That the Kanakas attach most importance to it may be gathered from the fact that it is celebrated only at very long intervals. In 1889 it was for the first time beheld by Europeans. Kanakas who otherwise would scarcely care to meet give up all hostile feeling for the time, and at the *Marawot* an *omnium gatherum* takes place which shows that, although the desire for seclusion is an obstacle to all traffic, there are yet ties between the people that prove their consanguinity. From the scant information it was possible to collect it would seem that no

single individual can arrange a *Marawot* feast, but that the consent of not a few people is necessary. This information is supported by the fact of the rare repetition of the performance. To direct a number of diverging ideas into one focus is probably no easier task among reserved and distrustful Kanakas than it is among equally distrustful but more affable Europeans.

For the *Marawot* the people build a platform of bamboo, raised about 50 to 60 feet above the ground. The whole structure is covered with green foliage and wreaths, so that it almost gives the impression of an old ivy-clad tower; gorgeously coloured crotons give liveliness to the sombre green. The platform is about 15 feet square and projects on all sides over the under-structure. On it a certain number of young men have to perform a sort of war-dance with spears and other arms. The structure, which is only held together by means of ligatures made of the bark of trees, possesses little stability, and sways with every motion of the dancers and before every puff of wind. It is, therefore, not easy to perform the dance on the platform, which is not provided with any kind of railing. To ensure success and to prevent accidents a great many rehearsals are necessary, during which the dancers grow accustomed to the uncomfortable motion and the giddy height, and learn to move freely without betraying outward signs of discomfort. The dancers and their weapons are richly decorated with gaily coloured feathers of the various parrots and cockatoos which abound in the country. The only *Marawot* which was ever witnessed by Europeans was held in Matupit, a small island in Blanche Bay. It lasted three days, and there were perhaps 300 to 400 spectators from various parts of the Gazelle-peninsula and the Duke of York group. The bamboo structure was left standing; and if anyone thought it just possible that bamboos might get loose, and, dropping from such a height, endanger the lives of passers-by, he was at liberty to remove the thing; but these are minor considerations with the Kanaka, and the work was left to the Europeans.

It is at present perfectly impossible to trace the origin of these customs or to interpret them in any plausible way. They have, however, all one thing in common—they have to be paid for by the uninitiated; they are shrouded with mystery, which is only revealed to those who become members by paying a certain entrance fee, and they enrich the members, particularly the leaders of the feast. The entrance fee varies between 50 to 100 fathoms of *dewarra*, which is equal to £5 10s., or about the annual subscription to a good English club. I have already shown that these customs diverged into a speculative direction only when they had become sufficiently established to be sur-

rounded with a halo of authority. It would therefore be wrong to suppose that merely the view of possible emolument led to their establishment.

Respecting the direct gain of those who give the feast another difficult question presents itself: Who gains, and how is a profit obtained? The chiefs admit that they profit by a feast of that kind, yet they have to advance the *dewarra* necessary to defray the first heavy expenses. It is said that each visitor has to pay a certain quantity of *dewarra*; but how can that be controlled considering that no Kanaka will pay for a thing he can have for nothing? To see the dance he need only climb a cocoanut-tree, and his food he brings with him. Yet it is quite unlikely that any Kanaka would incur the expense of such a feast without a fair chance of profit. There remains only one possible method—the *tambu*. We have seen that the Duk Duk and the *Eineth* could pronounce certain things to be *tambu* for a given time. At the end of that time it has to be bought off with *dewarra*. In case of mourning—where the *tambu* falls on all the members of the family—the woman who is the nearest relative to the deceased pays a piece of *dewarra* to the next male relative, who passes it on diminished by a portion (which he keeps for himself) to the next male, and so on till a very small part reaches the last relative. This is repeated for every object which has been *tambued*. In this manner, again, the women have to produce the *dewarra*, which enriches the men. A similar rule is perhaps observed at these feasts. Most likely a number of *tambus* are pronounced, and they have to be bought off. Now the question arises: Is the *tambu* laid on the men alone? Who, then, produces the *dewarra*, and how does the club or the chief make their profit? If the *tambu* is laid on the women also, why do they come to visit the performance, knowing, as they must do, that all the expense falls on them? It is clear that we do not as yet possess all the facts concerning these curious customs, and that it will require careful study to collect them, a task rendered particularly difficult through the reticence the Kanaka observes in conversation about these matters. But when we shall have solved the *dewarra* question we shall probably find that it represents only the speculative phase of a custom of which the key is to be looked for in that part of the Kanaka character which it is his constant effort to hide from the inquisitive glance of the European and from which springs the root of his manifest desire for seclusion.

The existence of all the customs we have described under the heading of Duk Duk is doomed. The awe which they formerly inspired has considerably faded before the European's contemptuous derision. The chiefs feel their power slip from their

hands, and hasten to turn into solid wealth a prerogative which, if they tried to preserve it, might vanish altogether. They sell the right of raising the Duk Duk to the tribes further inland, where the thick bush shields it from the European's withering eye, and where critical reflection lies as yet latent in the mind of the unsophisticated savage. They receive good sums from the new purchasers, and besides reserve to themselves the right of levying fines in case all the intricate rules are not strictly observed, thus ensuring to themselves a fair income until such time when white man's irresistible advance will necessitate a renewed removal in regions still more remote.

That time is not far distant. The expansion of the white races over the globe is a necessity which will slowly perhaps, but surely, break down all the barriers raised by climate and ruggedness to retard his progress in these islands. No time ought to be lost, therefore, to collect all possible information about customs of a race which is one of the very few still living in the stone period.

The plough of civilisation, in turning up hitherto virgin soil to prepare it for the seed of European culture, is sure to root up many weeds which, though noxious in the new field, were, if useless, at least ornamental. And as the zoologist reconstructs curious animals from the remains found in the layers of the crust of the earth, and through them is enabled to trace the origin of the living species of animals, so is the study of habits and customs of pristine races necessary to trace the development and history of our own.

MAY 25TH, 1897.

E. W. BRABROOK, Esq., F.S.A., *President, in the Chair.*

The Minutes of the last Meeting were read and signed.

The PRESIDENT observed that since the last Meeting the Institute had lost an early and most valuable supporter, and he himself had lost a personal friend of many years' standing, by the death of Sir Augustus Wollaston Franks, who was an accomplished student of every branch of antiquity. Nothing was more remarkable in his long career as Director and ultimately as President of the Society of Antiquaries of London than the depth and breadth of his archaeological learning. There seemed to be no subject that could be brought before that Society of which he was not master. In connection with the branches of archæology which touch most closely upon anthropology, he will be remembered for his researches into late Celtic antiquity, and for his happy definition of that period of art. As keeper of the ethnographical collections of the British Museum, and acting trustee of the Christy Collection, he commenced the practice which has been continued under Mr. Read, now his successor, of bringing before the Institute any remarkable ethnographical objects that were about to be acquired by either of those Institutions. He was for many years one of our Vice-Presidents, and displayed towards this Institute the same enlightened liberality which has distinguished him in other connections, having contributed largely to the fund raised for clearing off the debt with which the Institute was encumbered at its starting. His munificent gifts to the nation, far exceeding in value all that he had ever received in salary in his public employment, were fitly acknowledged by his being raised to the dignity of K.C.B. He was also a liberal donor of books to the Society of Antiquaries. When, about twenty-five years ago, it was suggested that the Council of the Institute should dine together after their meetings, Mr. Franks was one of those who most warmly supported the proposal; for a long time he sacrificed other engagements to that of thus meeting his colleagues, and he introduced to them at those dinners many congenial guests. This may appear to be a trivial incident to record, but it is in such slight indications of a kindly and generous nature that some of the pleasantest recollections of

departed friends are to be found. Of his skill and good fortune as a collector of antiquities, of his great learning in many obscure branches of Oriental art, of his enthusiastic devotion to antiquarian research, of his patient assiduity as an investigator, it is hardly necessary to speak. He inspired those who knew him best with the deepest admiration and attachment, and has left, not only in the public institutions of which he was an officer, but also in this Institute, a memory that will long be cherished.

Mr. W. GOWLAND then read Mr. HALL CHAMBERLAIN'S paper—"A Quinary System of Notation used in Lu-Choo."

After which Mr. A. L. LEWIS read his paper on "Ancient Measures in Prehistoric Monuments."

Discussion on these papers were carried on by the President, Messrs. GARSON, LEWIS, GOWLAND, and GOMME.

A vote of thanks was passed to the two authors.

ANCIENT MEASURES *in* PRE-HISTORIC MONUMENTS. By A. L. LEWIS, F.C.A., Treasurer, Anthropological Institute.

[WITH PLATE XIII.]

I HAVE no doubt that all who may listen to or read this paper are more or less acquainted with the account given by our much-lamented colleague, the late Mr. J. T. Bent, of the ruined cities of Mashonaland, and with the remarkable series of measurements found in them by Mr. R. M. W. Swan, but it is necessary that I should recapitulate the principal facts which bear upon the subject now to be considered. The largest ruins, it will be remembered, consist of a building known as the great Zimbabwe, constructed of small-squared stones without mortar, with herring-bone and other decorations on some parts of the walls, and containing a large and a small round tower, which, when complete, were probably solid cones of dry masonry; and of a fortress on a hill between 600 and 700 yards north from the Zimbabwe, which also contains what appears to have been a temple. There are other ruins of a similar description at Matindele and on the Lundi river, besides numerous smaller forts. At all the larger buildings there are indications of sun-worship or observance and of star-worship or observance, the character of which may be most readily gathered from the following extracts from Mr. Swan's chapter on orientation and measurement.

Having described various methods of ascertaining the length of a year by observing the position of the sun relatively to the equator or amongst the stars he says:—"At Zimbabwe all these methods seem to have been used, and to do so does not necessarily imply more astronomical knowledge than is possessed by the peasantry in any of the more secluded districts of Europe, where watches are not much used, and where almanacks are not read, but where the people have the habit of telling the time of the day and of the year by the motions of the sun and of the stars, for, to an agricultural people, the change in position of the sun in summer and winter is as obvious as the seasons themselves, and the variation of the times of rising of the stars with the seasons can as little escape observation."

"Zimbabwe is in south latitude $20^{\circ} 16' 30''$, and the sun, when rising there at the summer solstice, would bear east 25° south were the horizon level, but Mount Varoma interposes itself between the temple and the rising sun at this time, so that the sun attains an altitude of 5° before its rays reach the temple, then its amplitude will be more nearly 24° , and a line

produced in this direction from the altar will pass across the doorway of the sacred enclosure, where the curve of the wall changes its radius, and, roughly speaking, through the middle of the chevron pattern; the same line drawn in an opposite direction for 73 feet would fall on a tall monolith which we there found lying by its well-built foundation . . . this monolith was sufficiently tall to receive the rays of the sun when it rose over Mount Varoma, and the shadow of a monolith erected on the wall would fall on it at the same time, thus marking with great accuracy the occurrence of the solstice."

The points of sun-rising and setting at the summer and winter solstices are further distinguished in the various buildings by the positions of the decorative patterns on the outside walls, of which full particulars are given by Mr. Swan. The indications of star-worship or observance are of a very similar nature: some of them are as follows:—

The apparently irregular outline of the enclosing wall is really composed of a number of arcs of circles differing in radius, and the centre of each of these arcs, where altars were usually placed, has had a doorway or some other means of marking out the meridian placed north of it. "True north of the centre of the greater round tower we have a doorway in the wall of the sacred enclosure . . . the part of the great outer wall north of the tower seems also to have been marked, for about this point we found a great step constructed on its top about 5 feet high. Above the temple at the east end of the fortress on the hill a cliff rises perpendicularly for 50 feet, and poised on its top there stands a most remarkable great rock, which may once have been an object of veneration to the worshippers in the temple beneath it; it forms one of the highest points on the hill; a line drawn true south from this rock and produced 680 yards would pass through the doorway in the great temple and fall on the altar in the centre of the decorated arc. Until this line suggested itself we were puzzled to account for the peculiar character of the doorway."

"Every point from which northern stars could have been observed has been used for this purpose, and there is no temple there from which northern stars were not observed, while at the same time the openly displayed southern sky has been left unregarded; this of course points to a northern origin for the people, and suggests that before they came to Zimbabwe they had acquired the habit of observing certain stars . . . It seems a plausible supposition that, while the great temple itself was devoted to solar and analogous forms of worship, the little circular or partly circular temples within its walls . . . were dedicated to the cult of particular stars."

Respecting the subject more immediately before us, that of measurement, Mr. Swan says:—"The diameter of the great tower seems to have represented the unit of measure in the construction of the curves of the outer walls, and of all the regularly curved inner walls in the great temple, and in all the well built temples in Mashonaland; the diameter of the great tower at its base is 17·17 feet or 10 cubits (of 20·62 inches), and this is exactly equal to the circumference of the little tower."

On examining the radii and diameters of the various curves in the walls of the different buildings explored, Mr. Swan has found and given particulars of—

3 instances where the measurement is 17·17 feet.

3 instances where the measurement is double that, namely, 34·34 feet.

7 instances where the measurement is 54 feet.

3 instances where the measurement is half that, namely, 27 feet.

3 instances where the measurement is $107\frac{1}{2}$ feet or practically twice 54 feet.

2 instances where the measurement is 169·3 feet, and

1 instance where it is half that or $84\frac{1}{2}$ feet.

The diameter of the great tower is, as has already been stated, 17·17 feet, and that distance (including its double 34·34 feet) is found in six other instances. That distance, multiplied by 3·14, which is the ratio of circumference to diameter, equals 54 feet, and there are thirteen instances in which the 54 feet, or their half, or their double occur. When multiplied by $3·14^2$ the 17·17 feet amount to 169·3 feet, and of this, or its half, three instances occur. Thus there are twenty-two cases in which the measurements appear to be based on the diameter of the great tower, and these include nearly all the cases in which satisfactory measurements can be obtained; in those places where none of these measurements are found there seems always to have been some special reason for the exception. Mr. Swan says:—"The only interesting mathematical fact which seems to have been embodied in the architecture of the temples is the ratio of diameter to circumference, and it may have had an occult significance in the peculiar form of nature worship which was practised there; we do not suppose that it was intended to symbolise anything of an astronomical nature, and it is extremely improbable that the builders of Zimbabwe had any notion of mathematical astronomy, for their astronomy was purely empirical, and amounted merely to an observation of the more obvious motions of the heavenly bodies;¹ when the minds

¹ I have quoted Mr. Swan's own words upon this subject because they express very clearly some conclusions I had myself arrived at from other data.

of men were first interested in geometry it would at once occur to them that there must be some constant ratio between the circumference of a circle and its diameter, and they would easily discover what this ratio was, and they may have considered this discovery so important and significant that they desired to express it in their architecture."

If the builders of the Zimbabwe really had this purpose in view it must be confessed that they chose a more complicated manner of expression than might have been expected, but it does seem that certain definite measurements do occur so frequently in and about these structures that their occurrence cannot be a mere coincidence, but must be the result of a system of some kind.

It is a long distance to Great Britain from Mashonaland, or even from Arabia, which Mr. Bent thinks (with much reason) to have been the fatherland of the builders of the Mashonaland monuments, but I can find many instances of peculiarities of position and measurement in connection with our own stone circles, which are the same in principle and often in detail as those observed in South Africa by Mr. Swan.

I have already drawn attention in numerous papers read before the British Association, the Anthropological Institute, and various archaeological societies, to the connection of our circles with the rising sun, and in some cases with the northern stars, by means of menhirs, hills like Mount Varoma, or "remarkable great rocks" somewhat like that on the cliff above the temple at Zimbabwe, and I shall therefore confine my remarks on the present occasion to coincidences of measurement.

It is only within the last few months that Mr. C. W. Dymond, C.E., F.S.A., has published the final results of his very careful and precise measurements of the important group of megalithic monuments at Stanton Drew, seven miles south from Bristol, and has thereby given us the means of accurately comparing another set of measurements.

The Stanton Drew group consists of six items, namely, three circles of different sizes, two of which have short avenues attached to them, one group of three stones known as the "Cove," two stones in another direction, and a solitary stone called "Hauteville's Quoit." Of these the Cove, the central circle, and the north-eastern circle are in a straight line in one direction; and the Quoit, the central circle, and the south-western circle are in a straight line in another direction. Some people regard these lines as accidental coincidences, but the

chances are at least 100 to 1 against either of them happening accidentally, and perhaps 10,000 to 1 against both of them occurring in a group of only six items; the existence of similar lines in connection with other circles proves that they were intentional, and this proof is still further sustained by the proportioned diameters and distances.

The diameters of the circles are:—

North-east circle, 97 feet, or 100 of an ancient foot of 11·64 inches.

South-west circle, 145 feet, or 150 of an ancient foot of 11·64 inches (within 6 inches).

Great central circle, 368 feet, or 380 of an ancient foot of 11·64 inches (within $7\frac{1}{2}$ inches).

The length of the straight line from the centre of the "Cove," through that of the great circle to the centre of the north-eastern circle is 1,367 feet 8 inches, or not quite 1,410 of the foot of 11·64 inches, that is (within a working error of 8 inches (+) per 100 feet) 14 diameters of the north-eastern circle.

The length of the straight line from the centre of the great circle to Hauteville's Quoit is 1,856 feet, or $1,913\frac{1}{2}$ of the foot of 11·64 inches, that is (within a working error of 9 inches (+) per 100 feet) nineteen diameters of the north-eastern circle, or five diameters of the great circle. And I may remark that this point is the nearest to the great circle which brings in the diameters of both circles. This in my opinion tends to show that the position of Hauteville's Quoit was intentional and not accidental.

The length of the straight line from the centre of the south-western circle through that of the great circle to Hauteville's Quoit is $2,567\frac{1}{2}$ feet, or 2,647 of the foot of 11·64 inches, that is (within a working error of 4 inches (—) per 100 feet) seven diameters of the great circle.

The distance from the two stones to the centre of the great circle is 3,305 feet,¹ or $3,407\frac{1}{4}$ of the foot of 11·64 inches, that is (within a working error of 5 inches (—) per 100 feet) nine diameters of the great circle.

We find, therefore, that the diameters of the circles are in the relative proportions of 5, $7\frac{1}{2}$, and 19, that the diameter of the smallest circle is repeated fourteen times and nineteen times in other measurements, and that the diameter of the largest circle

¹ In his first publication Mr. Dymond stated this distance at 3,293 feet, and that from the great circle to Hauteville's Quoit at 1,852 feet only. If Mr. Dymond, notwithstanding his engineering skill and modern appliances, found mismeasurements in his own work we need not be surprised at finding fractional working errors in the measurements of those who set up these monuments so many centuries ago.

is repeated five, seven, and nine times in other measurements. These latter coincidences are not mentioned in Mr. Dymond's book, but have been deduced by me from his measurements, and there may be yet others which I have not discovered.

Five, seven, fourteen (which is twice seven), nine and nineteen are all more or less significant numbers. Nine is frequently associated with the stone circles, many of which are called "Nine stones," though they have originally consisted of more than that number; those who resorted to the Men-an-tol in Cornwall to heal their ailments passed through the hole in the stone nine times. Nineteen is the lunar cycle, the number of years in which it was thought the sun and moon returned to the same relative place in the heavens, and allusions to it have already been suspected in circles formed of nineteen stones. In connection with this number I must remind you of the oft-quoted extract from Hecataeus,¹ given by Diodorus Siculus, respecting the island of the Hyperboreans, where Apollo (or the sun) had a stately grove and renowned temple of a round form, beautified with many rich gifts, and of which he says farther, "that in this island the moon seems near the earth, that certain eminences of a terrestrial form are seen in it, that the god visits the island once in the course of nineteen years, in which period the stars complete their revolution, and that for this reason the Greeks distinguish the cycle of nineteen years by the name of the greater year." There is little doubt that the island referred to was Great Britain, and the temple has been thought to be that at Abury, but Stanton Drew, though much smaller, is far more accessible from the sea, and therefore more likely to have been known to casual visitors, and the embodiment of the number nineteen in its measurements makes its identity with the temple of Hecataeus very probable.

What Mr. Dymond has done for Stanton Drew, Mr. Hansford Worth, C.E., of Plymouth, has done for the remains at Merivale Bridge, Dartmoor; that is, he has given us, for the first time, a thoroughly accurate plan of them. These remains consist of two double rows of stones, running from slightly north of east to slightly south of west; the southern lines extend beyond the northern lines at each end, but further at the west than at the east; the distance between the two sets of rows is greater at the west than at the east, and nothing seems more unlikely at first sight than any fixed measurement or proportion in the laying out of these lines. Starting, however, at the narrow or east end we find that the length of the overlap of the southern beyond

¹ It is not certain whether this is Hecataeus of Abdera, who lived in the fourth century B.C., or Hecataeus of Miletus, who lived in the sixth century B.C.

the northern lines is the same as the width between the two, while the distance between the eastern ends of the northern and southern rows (diagonally) is the same as the greatest width of the two rows from outside to outside at the west end, viz., 1,300 inches, or 100 of a foot of about 13 inches, which seems to have been the unit of measurement; the distance (diagonally) between the western ends of the northern and southern lines is 2,600 inches, or 200 units. In other words the longest side of the triangular ending of the lines at the east end is the same length as the shortest side, and half the length of the longest side of their triangular ending at the west end. The length of the southern beyond the northern lines is in the proportion of five at the western end to two at the eastern end; the length of the southern lines is 10,369 inches, or 797·6 (practically 800) of the 13-inch unit, that is, eight times the distance between the ends of the rows at the east end, and four times the distance between the ends of the rows at the west end. The length of the northern lines is 7,148 inches, or 549·8 units (practically 550). A "bird's eye" view of these remains—a sort of "restoration" in fact—published in Rowe's "Perambulation of Dartmoor," 1830, depicts a circle at the eastern end of the northern lines, but Mr. Hansford Worth has satisfied himself that no such circle ever existed, and it may be considered certain that the eastern ends of the lines have not been interfered with. The western ends of both rows are represented in the same view as terminated by single stones somewhat taller than the rest, but these are not there now, nor can it be ascertained whether they ever existed; if they did they would bring the lines up to 800 units and about 552 units respectively, and there seems no reason to suppose that any other stones have been removed which would make any material alteration in the proportions stated. A small tumulus surrounded with stones stands across the southern lines very near their centre, it is in fact about 10 or 12 feet nearer the eastern than the western end, and anyone who objects to the idea that these lines were laid down by measurement is entitled to make the most of that difference; but I think it probable that this tumulus was made after the lines had been constructed, and that the exact middle of the lines was not ascertained by those who erected it. Besides the two double rows there are a circle of small stones and a menhir to the south of the western end of the lines; such measurements as can be deduced from them do not appear to be based on the same unit as those of the rows, but a straight line taken from the menhir through the centre of the circle due north would strike the western end of the northern lines and pass on to the

western extremity of Great Mis Tor. It seems probable therefore that the menhir and circle were set up at a later period than the rows, as they appear to have been set to them, but not at distances based on the same unit of measurement.

Our Journal for August, 1895, contains a paper in which, amongst other things, I have recorded a number of remarkable measurements and proportions in connection with five circles on Bodmin Moors in Cornwall, but, as the details are given in full in that paper, I need now only say that those circles, like the monuments we have been considering to-night, seem to have been arranged with much care and approximation to accuracy, for some purpose, or with some idea in view, which we are at present unable to ascertain.

The principal questions that we have to settle are, firstly, do the proportionate lengths and distances really exist? and secondly, if they do exist, are they the result of intention, or of accident?

As to the existence of the proportionate lengths and distances, I must point out that they are taken, not from my own measurements, but from the careful plans of skilled engineers and archaeologists, most of whom have no sympathy with the use I am making of the facts they have recorded. My part in the matter has simply been the conception that the multiplication table might usefully be applied to their figures, and its application accordingly, with the results which I have now laid before you, and which can be checked by anybody.

If it be admitted that the proportionate lengths and distances do exist, it will be for everyone to form his own opinion as to whether they were intentionally arranged or whether they are all the result of mere blind chance. For myself, I admit it to be difficult to believe that these apparently rude constructions have in reality been very carefully measured and arranged, and it is only by degrees that I have come to find it many times less difficult to believe this than to retain the old trust in the working of accident and chance.

Of course the further questions arise, "What do these arrangements mean?" and "Why should all this labour have been undertaken?" and I have been told, in effect, that unless the meaning of the facts can be explained their existence cannot be admitted. Of those who think thus I will ask in return, "Why did the builders of Stonehenge drag forty or fifty 'bluestones' of no inconsiderable weight from Wales, Devonshire or still further away, to Salisbury Plain?" "Why did the early inhabitants of Dartmoor set up a row of stones, nearly

two miles long, extending from a circle on one side of the river Erme to a tumulus on the other side of it?" We cannot deny that these things were done, because most of the stones remain there to this day, but we do not know why they were done, and so it is with the measurements.

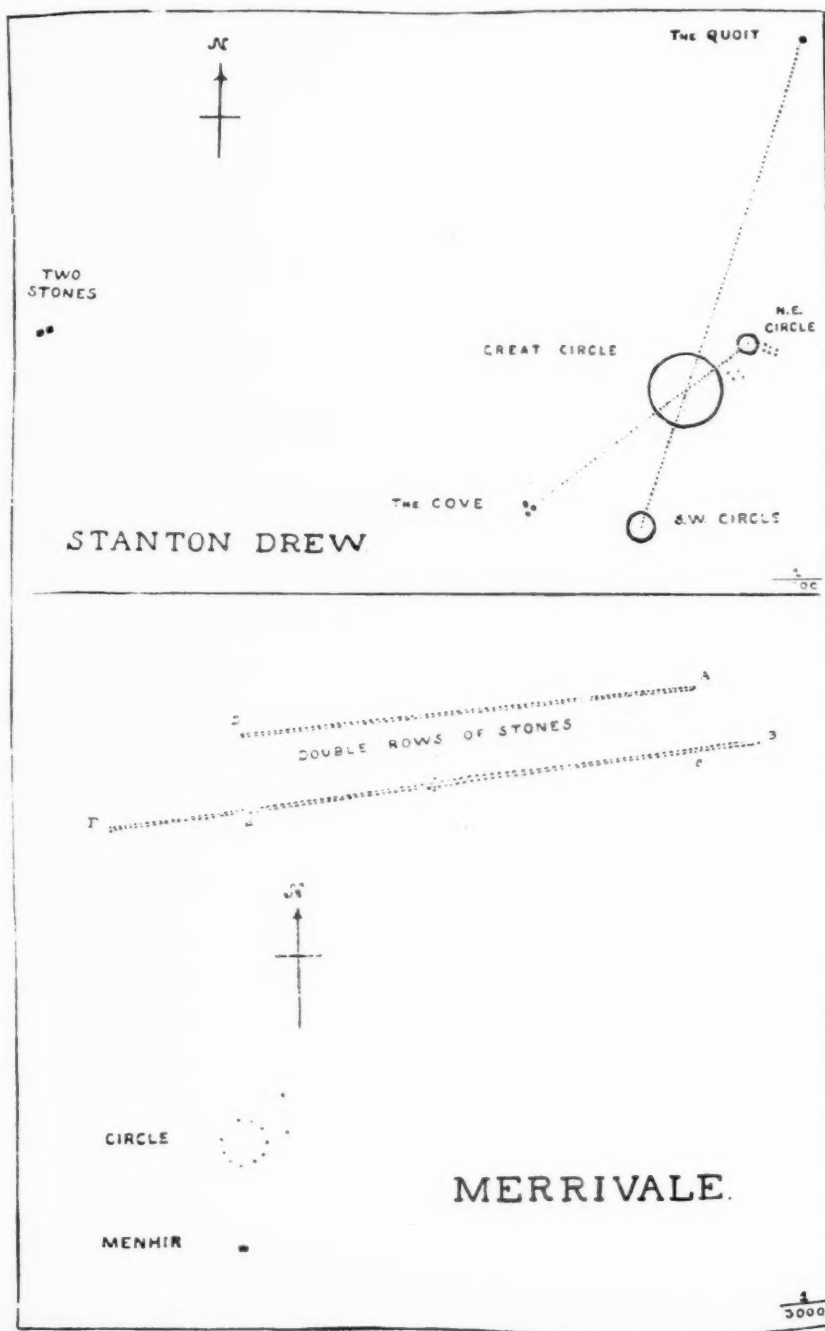
Finally, I have to point out that in each of the monuments I have spoken of the unit of measurement, if such there were, appears to have been different, which seems to indicate a separate influence, personal or otherwise, in the construction of each of them.

In setting up a number of stones in a large and regular circle there must at the very least have been the describing of a circle on the ground by means of a rope or pole, one end of which would be fixed to the centre, and the other taken round the circumference. In some cases this rope or pole may not have been measured at all; in others, and especially where proportionate measurements were intended, it may have been very carefully measured by any unit that happened to be available. All the units I have spoken of were in use round about the Mediterranean from two to three thousand years ago, and may have come here at various times and in various ways, the first to be brought here being perhaps by no means the oldest; but it does not necessarily follow that the unit I have mentioned in each case was actually used; I can only say that it suits the measurement, by working out in even numbers, better than any other that I can find, but that I may not have exhausted them all. The unit of measurement is, however, quite a secondary thing, and can, perhaps, never be proved, but only inferred; the great point to be established is that some of these apparently rude structures were in reality laid out in careful proportions, for some purpose, or with some idea, which we may hope at some time or other to discover.

The PRESIDENT complimented Mr. Lewis on his paper. He quite agreed that the measurements cannot be accidental, but must have been intentional.

Dr. GARSON remarked that the large temples, their positions, and measurements, were certainly not arrived at by chance, as can be seen by the orientation of Egyptian pyramids, temples, and some of the large temple remains, very probably of neolithic people. Professor Flinders Petrie observed this in this year's discoveries.

Mr. GOMME begged to differ from Mr. Lewis. He wanted evidence on measures *not* fitting, as well as measures suiting this theory.



Mr. LEWIS said in reply to Mr. Gomme that there were doubtless many of the rude stone monuments in which proportion could not be traced, but that fact in no way interfered with the fact that in others proportion could be traced. Even where there were no means of tracing it, as for instance in a single circle with no measurements about it of which to make a comparison, the diameter might have been based upon some unit or other and carefully measured from it. He thanked the meeting for the manner in which his paper had been received.

Explanation of Plate XIII.

Stanton Drew reduced from Mr. Dymond's plans to about 1 in 12,000. In consequence of the smallness of the scale the sizes of the Quoits, Cove, two detached stones and avenues are considerably exaggerated, and the circles are represented by continuous lines instead of separate stones, but the diameters of the circles and distances between them are carefully measured. The length of the line from the centre of the Cove through that of the great circle to the middle of the north-eastern circle is fourteen diameters of the north-eastern circle. The length of the straight line from the centre of the great circle to the Quoit is five diameters of the great circle or nineteen diameters of the north-eastern circle. The length of the straight line from the centre of the south-western circle to the Quoit is seven diameters of the great circle, and the distance from the two stones to the centre of the great circle is nine diameters of the great circle (all within a working error of less than one per cent).

Merrivale reduced from Mr. Hansford Worth's plan to about 1 in 3,000. In consequence of the smallness of the scale the stones are somewhat enlarged in size, but the lengths of the lines and distances between them are carefully measured. The distance from A to C (inside the lines) is the same as that from C to B. The distance from A to B is the same as that from D to E (outside the lines), which is half the distance from D to F, which latter is a quarter of the distance from F to B (the length of the longest line). The error of workmanship in these measurements is hardly distinguishable. There are some hut circles, detached cairns, etc., which are not indicated here as they have no connection with the rows.

NOTES on CRANIA of AUSTRALIAN ABORIGINES. By W. L. HENRY DUCKWORTH, M.A., Fellow of Jesus College, Cambridge. Communicated by Professor MACALISTER.

THE following notes refer to three male skulls: of which one is in the Cambridge Museum, the others in the possession of Prof. Haddon and J. B. Lock, Esq., respectively: the exact localities whence they came could not be ascertained. The principal points of interest are the following: The skull "A" is a heavy-browed prognathous skull of small cubic capacity; the central upper incisor tooth on the right side has been punched out. The remaining teeth are in good preservation; synostosis commencing in the sutures near the pterion on each side denotes the maturity of the specimen. It is a typical male skull of the "hypsistenocephalic" variety, and resembles specimens from the North Western parts of Australia and from Queensland.

In the specimen B, a large trephine hole (made *post mortem* apparently) pierces the right parietal bone. The most noticeable feature is the irregularity of the contour of the cranial vault in the median sagittal plane; this conformation, which has been termed bathrocephalic,¹ is unusual in skulls of aboriginal Australians. Besides, the specimen is scaphocephalic to a degree noticeable even in an Australian skull, and this is no doubt connected with the early obliteration of the sagittal suture, of which only slight traces persist (though the wisdom teeth have not yet completely perforated the alveolar margins). An exception to the last statement must however be made in the case of the third molar on the left side of the mandible, which is cutting its way through the alveolar border so displaced that its crown looks directly forwards instead of upwards; and abuts on the posterior surface of the adjacent second molar. The molar teeth are all of great size, and shew but slight evidence of usage. The petrous bones bear sharp eustachian processes on their inferior surfaces, and the foramen ovale on the left side is only separated from the petrosphenoid suture by an exceedingly thin bony lamina, and even the latter is absent from the right side on which the foramen spinosum is deficient. These are

¹ Two other skulls in the Cambridge collection, one being that of a French-woman, present this peculiarity. In an article by Giacomini in the "Archives Italiennes de Biologie," 1882, p. 251, a similar skull is figured, and the brain contained in it is described as possessing a double Rolandic sulcus. This, however, does not invariably accompany the deformity, for the Rolandic region was normal in a bathrocephalic head dissected in this Anatomy School.

probably examples of the persistence of a state of affairs normal in the foetus.

Skull 2154 in the Cambridge Catalogue.—This is another very prognathous specimen presenting in a marked degree the features typical of the aboriginal Australian's cranium. It is the skull of an adult male, but is not of advanced age, as the wisdom teeth have not long pierced the alveolar margins of the jaws. The right central upper incisor has been punched out. Marked scaphocephaly is shewn, but it is noteworthy that the sagittal suture is here quite unaffected by synostosis. There is a large epipteric ossicle on the left side.

Measurements relating to these three specimens have been recorded in tabular form. On comparing these with the figures drawn up as averages from measurements of the crania already in the Museum (*cf.* "A Critical Study of the Crania of Aboriginal Australians," this Journal, 1894.), I find exceedingly little deviation from the average. Two points are worthy of remark however: the orbital breadth, 47 mm., of the skull A, exceeds the average (41 mm.) drawn from measurements of twenty male crania: and the skulls A and 2154 are a good deal lighter than the average skull; this diminution in weight seems to affect both cranium and mandible. Lastly, observations made in reference to certain characteristics of Australian crania, gave results as follows: Hypsistenocephaly, supra-orbital notches (not foramina), vesalian foramina and a transverse occipital torus, occur in each specimen. The glenoid cavities are moderately deep in A, but much more shallow in B and in 2154, and in the latter give evidence of osteo-arthritis. The great wings of the sphenoid are deeply channelled on their external surfaces in A and 2154, but not in B.

The outline of the squamous part of the temporal bone on the side of the cranium, shews an angle where the mastoid portion joins it in A and 2154, but in B the transition is more gradual.

Cranium denoted by A. in the possession of J. B. Lock, Esq.

" " B. " " Prof. Haddon.

" " No. 2154 in the C. U. Anatomical Museum.

THREE CRANIA OF AUSTRALIAN ABORIGINES.

TABLE OF MEASUREMENTS.

Catalogue number	A.	2154	B.
Age	Adult.	Adult.	Adult.
Sex	♂	♂	♂
Cranial capacity	1225	1180	1300
Maximum length	180	175	193
Ophryo-iniac length	175	171	183
Ophryo-occipital length	176	170	189
Maximum breadth	127	133	130
Bi-asterial breadth	107	104	112
Bi-stephanic breadth	108	100	108
Bi-auricular breadth	119	116	112
Minimum frontal breadth	98	90	95
External bi-orbital breadth	110	106	107
Bi-zygomatic breadth	137	136	123
Bi-malar breadth	118	98	115
Bi-maxillary breadth	98	98	89
Jugo-nasal breadth	103	102	101
Naso-mental length	120	114	110
Ophryo-alveolar length	95	82	89
Naso-alveolar length	74	64	64
Basi-alveolar length	102	108	99
Basi-nasal length	101	98	100
Basi-bregmatic length	132	132	136
Basion-obelion length	130	127	124
Basion-lambda length	117	110	115
Basi-iniac length	82	73	80
Basion to opisthion; length	41	33	34
Breadth of foramen magnum	32	30	27
Orbital height	34	30	34
Orbital breadth	47	41	42
Nasal height	52	46	44
Nasal breadth	32	29	31
Palato-maxillary length	59	56	60
Palato-maxillary breadth	68	62	71
Arcs: Frontal	124	124	136
Parietal	124	118	141
Occipital superior	72	66	68
Occipital inferior	44	45	47
Supra-auricular	297	293	295
Oblique parietal	343	346	353
Jugo-nasal	118	110	114
Horizontal circumference	496	487	515
Minimum inter-orbital breadth	26	23	25
Occipito-spinal length	191	170	195
Occipito-alveolar length	201	180	205
Mandible-symphysis height	34	36	33
Coronoid height	64	62	56
Condylar height	60	59	51
Gonio-symphysial length	75	80	80

TABLE OF MEASUREMENTS—continued.

Catalogue number	A.	2154	B.
Age	Adult.	Adult.	Adult.
Sex	♂	♂	♂
Inter-gonial breadth	93	105	96
Inter-coronoid breadth	104	100	94
Inter-condylar breadth, exterior	130	121	115
Inter-condylar breadth, interior	91	88	72
Breadth ascending ramus	33	36	33
Angle	123°	107°	110°
Basi-mental length	110	108	103
Ophryo-mental length	141	135	135
Weight of jaw	80	92	85
Weight of jaw and skull	707	593	749
Weight of skull. . . .	627	501	664
	R.L.	R.L.	R.L.
Length, parieto-sphenoid suture ..	12	3 w.	11.11
		R.L.	R.L.
L. lacrymo-ethm. suture	13.8	7.5	8.9
Choanae, height	22	26	20
Choanae, breadth	32	28	29
Length, floor of nasal cavity	53	57	52
Combined length three molar teeth ..	{ 29 29 32 31 }	29	57
L. molars and pre-molars	{ 43 43 45 45 }	41	52
Least distance between temporal crests	99	92	106
Index: Cephalic	70.6	72.6	67.4
Vertical	73.4	75.4	70.5
Alveolar	101	110.2	99
Orbital	72.3	73.2	81
Nasal	61.5	63.4	70.5
Palato-maxillary	115.3	106.9	118.4
Facial (total)	97.76	100.74	91.2
Facial superior (Broca)	69.34	60.3	72.35
Facial superior (Kollmann)	54	47.1	52
Stephano-zygomatic	78.8	73.5	87.8
Gonio-zygomatic	65.68	77.2	78.04
Naso-malar (O. Thomas)	114.6	107.8	112.87
Dental (Flower)	42.6	41.8	52
Pterion-ossicles	{ R. .. L. ..	absent present	absent absent
Tuber-maxillare. . . .	.. ..	large	small
Inferior temporal crest .. ..	.. ..	spiny	tubercle
Posterior pal. spine .. ..	.. ..	obtuse	bifid
Fronto-maxillary suture .. ..	.. ..	absent	absent
Spheno-maxillary suture (sub-orbit) ..	.. ..	present	absent

CRANIUM OF AUSTRALIAN ABORIGINAL.

TABLE OF MEASUREMENTS.

Catalogue number..	B.	Catalogue number..	B.
Age.. .. .	Adult	Age.. .. .	Adult
Sex	♂	Sex	♂
Cranial capacity	1,300	Inter-coronoia breadth ..	94
Maximum length	193	Inter-condylar breadth, exterior ..	115
Ophryo-iniac length	183	Inter-condylar breadth, interior ..	72
Ophryo-occipital length	189	Breadth ascending ramus ..	33
Maximum breadth	130	Angle	110°
Bi-asterial breadth	112	Basi-mental length	103
Bi-stephanic breadth	108	Ophryo-mental length	135
Bi-auricular breadth	112	Height of jaw	85
Minimum frontal breadth	95	Weight of jaw and skull ..	749
External bi-orbital breadth	107	Weight of skull.. ..	664
Bi-zygomatic breadth	123		
Bi-malar breadth	115		R.L.
Bi-maxillary breadth	89	Length parieto-sphenoid suture ..	11.11
Jugo-nasal breadth	101	L. lacrymo-etam. suture ..	8.9
Naso-mental length	110	Choanæ, height	20
Ophryo-alveolar length	89	Choanæ, breadth	29
Naso-alveolar length	64	Length, floor of nasal cavity ..	52
Basi-alveolar length	99	Combined l. three molar teeth..	? 37
Basi-nasal length	100	L. molars and pre-molars ..	? 52
Basi-bregmatic length	136	Least distance between the tem-	
Basion-obelion length	124	poral crests	106
Basion-lambda length	115		
Basi-iniac length	80	Index: Cephalic	67.4
Basion to opisthion length	34	Vertical	70.5
Breadth of foramen magnum..	27	Alveolar	99
Orbital height	34	Orbital	81
Orbital breadth.. ..	42	Nasal	70.5
Nasal height	44	Palato-maxillary	118.4
Nasal breadth	31	Facial (total)	91.2
Palato-maxillary length	60	Facial superior (Broca) ..	72.35
Palato-maxillary breadth	71	Facial superior (Köll-	
Arcs: Frontal	136	mann)	52
Parietal	141	Stephano-zygomatic	87.8
Occipital superior	68	Gonio-zygomatic	78.04
Occipital inferior	47	Naso-malar (O. Thomas) ..	112.87
Supra-auricular.. ..	295	Dental (Flower)	52
Oblique parietal	353		
Jugo-nasal	114	Pterion-ossicles	{ R. absent
Horizontal circumference ..	515		{ L. absent
Minimum inter-orbital breadth	25	Tuber-maxillare	small
Occipito-spinal length	195	Inferior temporal crest..	{ blunt
Occipito-alveolar length	205		{ tubercle
Mandible-symphysis height ..	33	Posterior pal. spine	bifid
coronoia height	56	Fronto-maxillary suture ..	absent
condylar height	51	Spheno-maxillary suture ..	sub-
Gonio-symphysial length	80	orbit	absent
Inter-gonial breadth	96		

The MYTHOLOGY of WISE BIRDS. By H. COLLEY MARCH.

[WITH PLATES XIV AND XV.]

WHEN the human race was young, when man's imagination was unfettered by any trammels of science, when his keen and watchful observation of things was yet inexact and emotional, it seems to have been a matter of course that all individual objects, animals, trees, the products of his industry, even the celestial bodies, should hold converse with him, should possess various kinds of knowledge hidden from himself, too conscious of his own weakness and ignorance, bewildered by his inexplicable destiny and by the strange phenomena that environed him.

But from the beginning it was birds who spoke to most purpose, whose information was most valued, whose words often conveyed irony as well as wisdom, and from the plain where, in common with all things, they used the vernacular tongue, they rose in distinction by three stages: (1) birds retained the power of speech when all other animals had grown dumb; (2) birds constantly talked in a language of their own, which, though man could not unaided comprehend it, he was able to learn either by instruction or by magic; (3) birds spoke no longer a language that man by any means could understand, but nevertheless their wise and eloquent action it was more than ever necessary for all men to observe.

Literature abounds in poetical allusions to the wisdom of birds, to the warnings they desire to deliver, to the tidings they are ever ready to carry. "We bear our civil swords and native fire," says Prince John ("2 Hen. IV," v, 5), "as far as France; I heard a bird so sing." "Curse not the king," says the Preacher, "for a bird of the air shall carry the matter" (Eccl. x, 20).

Such allusions are poetical only; but the voices that primæval man heard, primæval whether in time or only in civilisation, were as real to him as the visions he saw. The history of demonology conclusively declares them to have been neither romance nor make-believe.

It is not difficult to advance reasons for a belief in the superhuman wisdom of birds. Their very aspect is usually one of alertness and intelligence. To great keenness of sense-organs is joined a rapid nerve-response, so that they are quickly aware of coming change or danger. Able to extend their horizon by mounting far up in the air, and having a telescopic vision, their knowledge of the world is proportionately enlarged. Secret

indeed must be that "path which no fowl knoweth, which the eye of the vulture hath not seen" (Job xxviii, 7). They fly swiftly whither they will, and all countries are free to them; they follow the climate they love; they go away, and return at the end of many days, year after year, companions of the spring. "The stork knoweth her appointed times; the crane and the swallow observe the time of their coming" (Jer. viii, 7). By clearing the land of vermin and dead organisms they perform important offices that were early recognised and highly valued by mankind. They exhibit obvious sagacity in choosing a site for nests, which they construct with admirable skill. Some of them are acquisitive, and some have a taste for decoration. Many of them sing melodiously, and a few can actually imitate articulate language.

It was natural that, in different countries, men should have been attracted by different orders of birds. The grallatores, or waders, whilst they were esteemed throughout the Old World, were chiefly venerated in Egypt; and the same may be said of the accipitres, such as eagles, hawks, and vultures. The Columbæ were most admired in the East; and, of the passeræ, the sub-order coniurostres found most favour in Europe.

The waders are generally of migratory habit, active, running rapidly, and possessing great powers of flight. They have three long front toes and one hinder toe, which is sometimes very small. In association with the raptorial hawk and vulture, they "were the scavengers of the Nile valley, and man's existence depended on them" ("Egypt," Perrot and Chipiez, i, 64, 65).

The ancient Egyptians, in their evolution of a doctrine of immortality, made grallatores the symbols of their creed. The Bennu, *Ardea bubulcus*, a sort of heron, was sacred to Osiris, the god of agriculture. It was the emblem of resurrection, and betokened the rising again of the sun, the return of Osiris to the light. It was sacred also to the planet Venus, whose appearance, sometimes in the evening and anon as a morning star, was a sign of the renewal of life (Pierret's "Egypt. Dict.," p. 94). As represented in a chamber at Philæ, it rests on the branches of a holy tamarisk-tree that overshadows a tomb (Wilkinson, "Anc. Egypt," v, 262).

In a hymn of the XIIth Dynasty we read, "I am the great Bennu, who am in Annu [Heliopolis]. I am the creator of all things" (Davis, "Book of the Dead," pp. 54, 55). And we are reminded of the gigantic crane that waded on the primæval ooze in the cosmogonic legends of other lands.

The Bennu originated the conception of the Phœnix (φοῖνιξ) a bird that Herodotus had never seen except in a picture, where

"its plumage was partly red in colour and partly golden, and as to outline and size very like an eagle" (ii, 73).

The story of the Phoenix springing anew from the ashes of a funeral pyre built by itself is of much later date, and it was firmly believed by the fathers of our faith. Lactantius (A.D. 300) composed a beautiful poem on this bird, and fully described its habits and glorious appearance. "Unica Phoenix," he writes, "unica, sed vivit morte refecta sua," and afterwards, discussing its reproduction, observes,—

"Femina vel mas hæc, seu neutram, seu sit utrumque,
Felix quæ Veneris fœdera nulla colit;
Mors illi Venus est, sola est in morte voluptas;
Ut possit nasci, appetit usque mori."

Whether masculine, or feminine, or neither, or both, happy is it to need no marriage. Its Venus is Death. Its lust and delight are to die, that it may be born again. And Rufinus, who lived a hundred years afterwards, uses the story as an argument in support of the Incarnation. "Why," he asks, "should it seem wonderful that a virgin should conceive, when the Eastern bird appears to be born or reborn without a consort? for he is always only one, and ever succeeds himself by birth or rebirth" ("In Symb.," p. 548).

In the catacombs at Rome, the Phoenix, with a nimbus round its head, is perched on the boughs of a tree by the side of St. Paul; and on the ancient basilica of the same apostle a sculpture of it, inscribed with its name, appears over the doorway.

The Egyptians, who bestowed so much care and cost upon their sepulchres, nevertheless believed that the two most important parts of a man did not remain in the tomb, namely the *ba* and the *khu*; and these they always represented in the form of grallatorial birds. Their conception of the *ba* closely corresponded, Wiedemann thinks, to our "soul," for it was a being which, on the death of the man in whose body it had dwelt, left it in order to fly to the gods to whom it was akin, and with whom it abode when not united to the man. But it was neither immaterial nor able to dispense with food and drink. Sometimes the *ba* bore, in funerary paintings, a human head; and sometimes, too, it was furnished with human hands ("Egypt. Doct. Immort.," Eng. Trans., p. 42). Hence, probably, originated the sirens and harpies as figured by the Greeks. The Egyptians often depicted the *ba* as a bird flying down from heaven with the *ankh*, the symbol of life, in its hand, and approaching the burial-place to visit the mummy, or as flying down into the vault, with the offerings it had found at the door of the tomb, carrying bread in one hand and a jar of water in

the other, food and drink for the body that once invested it (*Ibid.*).

A drawing of the bird is given in "Beni Hasan" (iii, Pl. II, Figs. 3, 10). It has no human features, but is entirely grallatorial in appearance (Fig. 1). Mr. Griffith calls it a plover, and says that the hieroglyphic value of the root *ba* is a soul in bird form, and that it was probably at one time the name of an actual bird. He further points out that the pictorial signs usually, but not always, show a coloured feather or tuft projecting from the front of the bird's neck, just below the head, or sometimes from the breast.

I venture to think that the projection is really not a tuft of feathers, but the reminiscence of a pouch such as that which "hangs down like a dew-lap" in front of the neck of some cranes of India and Africa, and which they are capable of inflating. In the Argala, this pouch falls about a foot (Fig. 2); in the Marabout, it is much shorter. These birds are very voracious, and assist vultures in clearing away garbage from the vicinity of negro villages (Dallas). And it is noteworthy, as regards the functions of the *ba*, that some birds of this class feed their young by inserting their bills into the chick's mouth and disgorging some of the half-digested food from their own stomachs. Herons and storks can also disgorge food.

This conjecture is supported by the figure of a bird on a vase found at Ialysos, in Rhodes, as given in "Primitive Greece" by Perrot and Chipiez (ii, 377). Here the bird is a well-marked grallator; and it has, protruding from its breast, an unmistakable pouch (Fig. 3). If we follow its Egyptian analogies, we may regard it as representing "a soul," and may further suppose that the crane-like animals that abound on Mycenæan vases (Fig. 4) are "souls" also, and not "solar geese." Their mythology in these ceramic pictures appears to be connected with a world-octopus, whose outstretched arms extend through the universe.

The other important portion of a dead man that did not reside with him in the tomb was the *khu* (or *ikh*), represented by a highly conventionalised crested ibis. This bird also is drawn in "Beni Hasan" (iii, Pl. II, Fig. 4); and Mr. Griffith remarks that the hieroglyph occurs with the meanings (1) brilliant, excellent, useful, and (2) the glorified spirit of a man after death. Others have translated it "the luminous or shining one," "the intelligence," "the soul." The pyramid texts reveal that the *khus* of the gods lived in heaven, whither went the *khu* of a man after death. We read, "He standeth among the *khus*;" "Give him his sceptre among the *khus*;" "Horus hath given thee his eye to strengthen thee withal, that thou mayest

prevail among the *khus*." And we are reminded that, of all our faculties, vision is the sense of intelligence. Woden gave one of his eyes to buy for man a draught of knowledge from the Brook of Wisdom.

In the "Book of the Dead" (ch. xcii) the deceased prays for the liberation of his *ba*, his *khaib* or shadow, represented by a sunshade, and his *khu*, from those who fetter *bas* and *khus*, who shut in the *khaib* of the dead, and who shackle the limbs of Osiris ("Papyrus of Ani," Budge, pp. 117, 319). And elsewhere (ch. xci) is a formula to enable the *khu* to pass from the tomb to the habitations of Ra and Hathor (pp. 115, 319). And again we read, "I am provided, I am a *khu* provided; I have made my way to the abode of Ra and Hathor" (p. 115); "I am a *khu* furnished with what I need" (p. 319).

The Ibis itself is migratory, taking long journeys every year, but always returning to the place it left. It is strictly monogamous and most affectionate towards its mate and its young. It is fond of pure, fresh water; and accompanying, it seems to herald, the annual overflow of the Nile.

Is it possible for us to distinguish between two such conceptions as the *ba* and the *khu*? Is Pierret right in translating them "mon âme et mon intelligence"? Do the French words imply a sufficient diversity of meaning? Ought we not rather to follow the difference between the ravenous Argala and the dainty Ibis? The *ba* and the *khu* would have been designated by Aristotle the *ψυχή* and the *πνεῦμα*, the nutritive soul and the rational soul; and St. Paul might have called the *ba*-bird the *σῶμα ψυχικόν*, and the *khu*-bird the *σῶμα πνευματικόν*. In the nutritive soul arose organic cravings, whilst the rational soul was the seat of intellectual processes. The *ba*-crane busied itself in carrying food and drink to the mummy; the *khu*-ibis provided itself with mystical information and protective formulæ for its long and perilous journey to the abode of the gods.

A similar distinction may be perceived between the two wise ravens of Woden, that were called Huginn and Muninn. The name Huginn is from the noun *hugr*, "the intellect," and the verb *huga* is "to mind, attend to, think out;" whereas Muninn is "the mind" in the sense of "longing, love, delight." "Woden's two ravens," says "Grimnis Mal," "fly every day over the mighty earth. I fear for Huginn lest he never come back, yet for Muninn I am more fearful still." In other words, "the thoughts of Woden range far indeed, yet not so far as the wandering of his desire." "There flew two ravens," says the "Völuspá," "from Woden's shoulders, Huginn to the gallows, Muninn to the carrion." And here carrion represents carnal

appetite, the devouring of slaughtered foes; whilst the mystic gallows, of which Woden was lord, is the symbol of justice and self-sacrifice.

Before leaving the grallatores, let us remember, first, that in Germany storks have always been venerated for their kindliness and wisdom. Happy is that man on whose house they build, for to him they bring promise of children. And, second, that cranes are remarkable for their vigilance. When a flock of these birds goes to sleep, one of them remains awake to watch over the common safety. Long ago, in Scandinavia, cranes were kept by sea-rovers, for the sake of the warning uttered by those birds on the approach of strange vessels, or animals, or men, when they raised a prodigious uproar, the *κλαγγὴ γεράνων* of Homer (*"Iliad,"* iii, 3). Amongst the contents of the ship-tombs of Sweden, that belong to the Bronze Age, are usually to be found the bones of the crane (*Stolpe*).

The raptors are good scavengers. Some of them are acquisitive, and even vultures have been known to steal highly coloured objects. They are kind to their young, and defend them with great courage. Their wisdom has received general recognition. On the Nile, the hawk was the sign of Ra, to whose priests it brought a sacred book of ritual. In like manner the eagle of Krishna recovered the lost volumes of knowledge. An eagle was the chosen messenger of Jupiter. Its fierce flight towards the solar heat associated it with the sun and with fire. It stood in apposition with the bolts of Jove, and was an attribute of Thor the Thunderer. On the highest summit of Lycæos, a mountain of Arcadia, was an altar to Zeus, in front of which, towards the east, were two pillars bearing eagles. Throughout Greece the eagle was sacred to him; and a golden image of this bird was found in the third city of Troy (*Schliemann, "Ilios,"* p. 503).

The Egyptians painted on the ceilings of their homes and tombs the outspread wings of a vulture, and regarded it as a maternal emblem of protection and preservation. Mr. Flinders Petrie says, "There is perhaps no sight in the animal world more imposing than one of these birds stretched out with a span of some 9 or 10 feet, hanging overhead in the air; and not being hurtful, the vulture came to be honoured as a type of maternal care" (*"Egyptian Dec. Art,"* p. 111).

In the *"Adventures of Sanehat,"* an Egyptian tale of the XIIth Dynasty, it is related that "the king Se-hotep-abra flew up to heaven and joined the solar disc; the follower of the god met his maker; a hawk soared with his followers." This account, which Mr. Petrie regards as indicating a serious popular belief, would almost seem to be intentionally poetical,

like the exclamation of St. Dunstan over the blessed Edgitha, "Soon shall this beloved bird take its flight to God." On the other hand, we find in the "Book of Lismore" a passage that describes "the preaching which Elijah is wont to make to the souls of the righteous under the tree of life in paradise. Now when Elijah opens the book for the preaching, then come the souls of the righteous in shapes of bright white birds to him from every part." And we are told by Florence of Worcester that from the innocent head of the murdered boy-king Kenelm a milk-white dove, *lactea columba*, with golden wings, flew to heaven.

The case of the Owl is full of difficulty. In Egypt this bird was altogether rejected as ill-omened and unclean; and the Arabs still hold it in abhorrence. Hipponax (B.C. 540) considered it as the herald of death, and in later times its presentment was accounted good against the evil eye. Though it cares for its young, it builds no proper nest, and it exhales a disagreeable and unwholesome smell. Those persons who think that its aspect suggests wisdom may be referred to the remarks of an eminent naturalist (Dallas, "Animal Kingdom," p. 617), who says, "Its eyes, of extraordinary size, are fixed in the orbits in such a manner as to look directly forwards; and its peculiar vacant stare when exposed to the light of day gives it a most ludicrous appearance." Yet this foolish bird of ill omen, with rank odour and foetid breath, was made an attribute of Pallas Athene, and was sacred to Minerva.

Can any explanation be offered? Schliemann found, in the third and fourth cities of Troy, a great number of what he called "owl-headed" vases; and he believed that they were imitations of that bird and were intended to represent an owl-headed divinity, even Athene Glaukôpis herself. He fortified his belief by the analogy of Hera Boôpis, who had, he considered, not only the soft, beautiful eyes of an ox, but the actual unlovely head of a cow. And it is a fact that cows were sacrificed to that goddess. On the other hand, it is certain that the owl was never sacrificed to Athene, whose offerings were rams and bulls and cows. And an examination of a long series of the so-called owl-headed vases has conclusively shown not only that they bear the characteristics of a woman, as Schliemann himself pointed out, but that, contrary to his opinion, the head is human also.

It is true that γλαυῦξ is an owl; but it is also true that by a coincidence γλανκός means blue—bright, gleaming, cerulean blue. Blue-eyed races of men were called γλανκόματοι, and for this colour the Greeks had no other name; for κνάνεος was their dark-blue. But no tinge of blue can be seen in the shining eyes of the owl.

On the whole, Professor Sayce is probably right in supposing that this goddess of predominant maternal characteristics, mistaken by Schliemann for an owl-headed divinity, was she of the East who went under the various names of Atê, Atargatis, Kybele, Ma, and Omphale, and who was originally very different in kind from Athene, the virgin goddess of war. And we may perhaps surmise that the intensely owl-like physiognomy of these barbarous fictile faces, that deceived Schliemann, likewise misled the early Greeks, so that when the coalescence of Atê and Athene took place a veritable owl was represented as the latter's attribute. It was the goddess and not her bird, who was wise and gracious and brave.

As poetic licence has, in some cases, given to swan-maidens a plumage of dove's feathers, so artistic error may be responsible for transforming the highly prized cranes of the North into "swans and solar geese," though this change can hardly explain the regard paid to the Brahminical goose in Ceylon. Herodotus (ii 72) mentions the *χρηαλώπηξ*, a species of duck, as sacred to the Nile. Judging by representations of offerings to the dead, we must believe that the ancient Egyptians used the duck as a favourite article of food. Geese are good guardians, as they awake at the slightest noise. They are known to be highly sensitive to the delicate tremors that precede an earthquake. The Roman capitol was saved by them. They can become personally attached to human beings, and instances are recorded of their having acted as guides to blind persons.

Before passing on, it may be noted that the early inhabitants of Latium had an ancient oracle of Mars at Tiora Matiene, where responses were delivered by a woodpecker (*picus*); that the wren, a bird of similar habits, is revered for its wisdom in the Isle of Man; and further that the gift of prophecy was possessed by the Simurgh, the mythical bird of Persia.

Whatever recensions the Kalevala may have received, its thought is eminently primitive in cast, and it is especially valuable as coming from Finns, a people who were adepts in sorcery and the heirs of Eastern magic. In this epic all manner of things are gifted with speech. A ship, with the voice of a girl, complains that she is left to rot in the docks, and declares that she would rather be a tree again, with squirrels on her boughs. She was the magic barque built by the imperturbable Väinämöinen after he had obtained from Sampa timber wherewith to construct the stem and the keel. To this end, Sampa came to a poplar, twenty feet high, and was brandishing his axe, when the tree exclaimed, "What dost thou want of me?" Sampa replied, "I desire to construct a boat for the Father of Spells." But the poplar rejoined, "The ship made of

me would leak everywhere and go to the bottom. For my bole is full of perforations. Thrice this summer has the worm that hides under my roots eaten into my core." Thereupon Sampa approached a pine, forty feet high, and striking it with his axe, inquired, "Canst thou serve to build a boat for the Father of Spells?" But the pine answered, "Thou mayest not make a six-clinkered barque of me, for I am too unlucky. Thrice this summer the raven has croaked from my summit, the crow cawed from my branches." Then he put his question to an oak, sixty feet high, and the oak gave him a proud answer and said, "Assuredly you can make a stem and a keel for a ship of me. For I am neither ungrown nor unseasoned, and in my trunk there are no holes. And as for good omens, thrice this summer, during the days of utmost heat, the sun has covered me with his glory, whilst the moon has glittered on my crown, and birds have nested in my boughs."

Then Sampa felled the oak, and cut it up into planks and brought them to the Father of Spells. And he, as he joined the timbers by means of magical utterances, all at once forgot three words; and he deeply pondered where those words could be found unless on the head of swallows, on the neck of swans, on the back of geese. But though he slew heaps of such birds, not a single word, nor the half of one, could he find. Again profoundly musing, he thought the words might be discovered under the tongue of a summer reindeer, or in the mouth of a white squirrel; and he killed many of those rare animals and found, indeed, a hundred words; but not one was of any use.

Then he visited the regions of the dead, and besought the faery daughters of the Isle of Manala to tell him the three grand magical words. But their queen-mother not merely refused her aid, but did her utmost to ensnare him. And it was only by taking the sinuous form and the seaweed colour of a serpent that he was able to escape through the meshes of her enchanted net.

Ultimately he contrived to get himself swallowed by Wipunen, a giant sorcerer, and, by setting up a forge within his body, so wrung him by intestinal pain that he incontinently uttered all he knew, and disgorged the long-sought spell.

Talking trees were by no means confined to Finland. The Chaldæans had a sacred pine that declaimed its wrath; and the ilex groves (*φηγίοι*) of Epirus, the speaking oaks (*αἱ προσήγοροι δρύες*), told Ulysses the will of Zeus.

As a general rule the objects that talk in the Kalevala, as the preceding extracts have shown, repeat the commonplaces of rustic lore; but a somewhat higher sort of wisdom may be

perceived in the speech of *birds*, who seem to be the only animals whose remarks are distinctly ironical.

"Alas!" exclaimed the young girl Osmotar, "the beer that I have brewed is bad." A redbreast chanted from the tree-top, a thrush sang from the point of the roof, "No! the beer is good to drink; but it ought to have been brewed in a barrel and kept in a cave. And the barrel should be made of oak and bound with hoops of copper."

The queen Pohjola changed herself into a dove, and approached Ilmarinen's forge. "What dost thou here?" asked the smith as the bird alighted on his window. "I have come to bring thee tidings," was the reply. This reminds us of the Irish legend of St. Brenainn (A.D. 500) who had remained in church after mass when the clerics were gone to the refectory, and he saw on the window a radiant bird, which came in and sat on the altar. "A blessing on thee!" said the bird. "May God bless thee," said Brenainn, "but who art thou?" "Michael the angel," replied the bird, "come to make music for thee, and to commune with thee." Under A.D. 806, The Four Masters say, "It was in this year that the birds used to speak with human voice."

A finch, chanting from the bushes, told the son of Kalervo, who was in trouble, that it was time for him to eat, and a crow, with its harsh voice, said to him, "Why art thou cast down? Take a twig of birch and drive the cattle into the marsh."

Once upon a time the earth was covered with forests, but no cereals would grow; and when the dauntless Wäinamoinen was sorely perplexed thereat, a tom-tit chanted from a tree, "Neither barley nor oats will thrive unless the trees that overshadow the land be cut down and burned with fire." Then Wäinamoinen felled all the trees but one, a beautiful birch, that birds might roost thereon, and the cuckoo sing from its summit. And lo! an eagle, flying across the sky, asked why this tree had been spared, and thought so well of the reason given, that he fetched fire to the trees that lay on the ground, and they were reduced to ashes. Moreover, a cuckoo came to the birch and sang the praises of Wäinamoinen.

This curious action of the eagle was consistent with that bird's associations. The joyous Lemminkainen on one occasion found his course obstructed by a cataract of fire, in which was an island of fire, where stood a rock of fire, and on its summit was an eagle of fire, from whose mouth issued flames and whose plumage blazed like stars. On returning home to his mother, the joyous Lemminkainen found that her house had been burnt to the ground, and its very ashes scattered by the wind; and he sought information of an eagle that happened

to be hovering in the air. The careless bird had forgotten all about the matter, but concealed its ignorance by saying, what was not the fact, "Your mother is dead ; she has perished by the sword."

On another occasion, the position of these worthies was reversed, and the mother of Lemminkainen, seeking her lost son, demanded him of the trees. These, both pines and oaks, said, not unreasonably, "We have trouble enough of our own without thinking of thy son. We have been created by a cruel destiny for days of sorrow: we are felled and dismembered for food and fuel ; we are burnt up to clear the very ground we stand upon." Then she addressed herself to the road, and the highway replied, not without justice, "I have too many troubles of my own, always torn by wheels and lacerated by heavy feet, to care for thy son." And when, next, the moon was appealed to, she also could attend to nothing but her own sufferings, shining solitary through the bitter cold of interminable winters. But the sun told her that the dead body of her lost one lay in the dark waters of death. So, with a long grapnel, at infinite pains, she succeeded in bringing to bank a few fragments of her boy. And when she beheld them, she wept and exclaimed, "Is it in any wise possible that from these torn remains can come again a man and a hero ?"

A raven who heard these words promptly replied—mark the irony—"No ! a man can never be restored from what has been so cruelly lacerated. Why, a trout has eaten the eyes ; a pike has devoured the shoulders. Cast thy son again into the waters, and perhaps he will there become a walrus or a whale."

We come now to another phase of thought, where birds alone spoke, and where men did not understand their language as a matter of course, but had to learn it by instruction or by magic. We find it in Esthonia, whose legends contain allusions both to the Finns, and to Finnish myth. One of the old Finnish and Esthonian gods was Ukko, lord of the air, who had three daughters, two of whom, Linda and Jutta, were queens of the birds, whilst Siura was a blue bird herself. We read of a maiden that, "as luck would have it, she had learned the language of birds from her mother when she was a child. A raven was sitting in the branches of a pine, preening its feathers, and the girl called to it, "Dear bird of wisdom, come to my aid." "What help dost thou need?" asked the raven. "Warn the king's son of the misfortune that has befallen me." The raven promised to do so if it could find any one who knew its language. Towards evening the voice of the raven was heard croaking on the top of the pine, and the anxious girl

hastened to inquire what tidings it had brought. The raven had had the good fortune to meet with the son of a magician in the king's garden, who thoroughly understood the speech of birds; and the message was that the maiden must not sleep on the ninth night, for a deliverer would then appear to rescue her; and on the ninth night the prince himself rode up, and lifted the damsel into the saddle behind him. And presently in the dawning light the birds woke up and began to sing; and if she had only listened to their warnings they would have profited her more than the sweet words of her lover, which alone she heard. And so it came to pass that the maiden, pursued by her mother's malevolent sorcery, slipped from the horse and disappeared beneath the surface of a stream. The unhappy prince went for aid to the dwelling of some spinsters of gold; and they gathered magic herbs and rubbed them with flour into a dough, and baked it for him, and he ate it at night. Thus was he made to understand everything that the knowing birds *say to one another*, for they are gifted with much wisdom that is hidden from man. And the prince rode away into the wood, and listened to the birds as they talked of the affairs of persons who were unknown to him. But presently a thrush began to speak of the stupidity of men who cannot understand the simplest things. "Here is a damsel who for a whole year has lain in the river in the form of a water-lily, and no one has been able to release her. Even her lover has passed by and heard her voice, and was none the wiser." "And yet," said a magpie, "the maiden was punished for his sake." "She could easily be set free," continued the thrush, "if the matter could be explained to the old magician of Finland." By-and-by the prince heard one swallow say to another, "Let us go to Finland, where we can build our nests better than here." And the prince begged them to carry a message to the sorcerer. In a week's time, having heard nothing, he was afraid the swallows had forgotten him, when a great eagle circled above him high in the air and presently descended and alighted upon a lime, and delivered to him full instructions from the old magician in Finland. But the task laid upon him was so hard, that days passed by, and still he lacked courage for the enterprise. At length a crow said to him, "Why dost thou neglect to follow the old man's advice? He has never given false information, and the language of birds never deceives."

In another story we read that a white bird perched on the ship, and the wise Finn, who knew its language, asked for tidings of the boy; and the bird answered that he had wandered away into a beautiful country and would never return.

And again, a young man sought counsel of a great magician

of the East, who said, "Men have but little wisdom. God's birds are thy best guides, if thou wilt learn their language." And he prepared a potent charm by boiling nine kinds of magic herbs which he had gathered by moonlight, and he made the young man drink of it every day, and then the language of birds became clear to him. And so wherever he went he had company, for he understood their speech, and many things were revealed to him which human wisdom could never have discovered; *and they led him whither he wished to go.*

From Esthonia we pass to Scandinavia, and there too we find Finnish influence. Even as Hiisi, an ancient god of the Finns, was represented on horseback preceded by a bird, so the mounted Woden follows the flight of a raven. The birds were path-finders. With ravens, indeed, Woden was closely associated. He was called Hrafn-áss, or Hrafn-gob, the Raven-god; Hrafn-stýrandi, or Hrafn-dróttinn, the Lord or Ruler of Ravens; Hrafn-freistadr, the Raven-friend; and Hrafn-blætr. This last epithet has been generally mistranslated the Sacrificer of Ravens; but its correct meaning is the Raven-hallower, he who, at a special sacrifice, devoted or consecrated ravens to the discharge of some particular function.

In the Landnamabók we read about one "Flóki, son of Vilgerð, who was a mighty Viking. He made ready to search for Snjóland [in Iceland], setting forth from Rogaland [in the district of Stavanger]. At that time they lay in Snjörund. He provided a great sacrifice, and hallowed—*blotadi*—three ravens to show him the way." Lawman Hauk, who A.D. 1300 wrote a recension of this book of Ari's, adds, "because mariners in the North had then no loadstone," forgetting that seamen were accustomed to steer by the stars. The true reason is that Flóki was ignorant of the precise location of Iceland, and was obliged to adopt a well-known plan for finding it out. The narrative proceeds: "They raised a cairn where the sacrificial feast had been held, and called it Flóka-varða—Flóki's beacon. It is at the junction of Rogaland and Hörðaland. He fared first to Hjaltland, and lay in Flóka-vagi—Flóki's bay. There in Geirhild's fjord was drowned Geirhild, his daughter. [These places are probably now Flekkefjord and Kvinsdal fjord.] In the ship with Flóki was one Faxi, a Hebrides man. Thence Flóki sailed to the Faroe Islands, and there he gave in marriage one of his daughters, from whom came Thróndr of Göta. *And from there he sailed out to sea with the three ravens that he had hallowed in Norway.* And the first which he let loose returned to the prow. Another, having flown up into the air, also came back to the ship. But the third flew away in that direction where presently they found land. They came

eastwards to Horn, and sailed along the southern coast; and as they drew west to Reykja-nes the firth opened out, so that they saw Snæfells-nes. Then said Faxi, 'This is a great country that we have found, and here, too, is a big waterfall.' And this was afterwards called Faxe-óss."

We cannot doubt that the birds were liberated in succession after considerable intervals of time, the ship still holding a northerly course; and that when the last raven rose up in the air, and the horizon receded from its view, then all at once the bright gleam of the snow-clad mountain caught its eye, and it flew straight to the shore.

It is noteworthy that the great diluvial legend, however it originated, contains many realistic details, such as the use of bitumen for caulking the ship. The Mosaic account is perhaps a little less intelligible than that of the Chaldeans, but both heroes adopted the same method of ascertaining the proximity of land. They both employed a dove and a raven, but Izdubar also a swallow. A raven will fly towards the first land it sees, and a dove or a swallow makes for the home it knows. The raven of Noah went forth to and fro until the waters were dried up from off the earth, and the dove did not at last return (Gen. viii, 7); whereas Izdubar's dove came back, whilst his raven went forth, and saw the decrease of waters, and wandered away and returned not (George Smith, "Chald. Account of Genesis," p. 270).

The wisdom of the conirosters was recognised of old in all countries. Ravens assemble from enormous distances round any supply of food, led, it is believed, rather by their powerful sight than by their sense of smell. Birds of the crow family will, even in a state of nature, mimic the voices of other animals, such as the lamb, the kite, the owl, the cat; and in confinement they will imitate the barking of a dog, the grating of a saw, and the human voice, of which they can be taught to repeat a few words. They have much curiosity and love of mischief, and will steal and secrete glittering objects: they have been known to bring food for days together to a wounded dog; they have a keen perception of the approach of danger, and give warning of it to their friends. Thus the Buphaginæ, or Ox-peckers, of Africa, who extract the larvæ of bot-flies from the backs of horned cattle, to the great delight and relief of the latter, have such an understanding with their four-footed companions, that though with a domestic animal they allow man to come very near without any alarm, yet for a wild animal they give a signal of danger at man's distant approach ("A Breath from the Veldt," J. G. Millais).

We cannot be surprised, then, that Pallas Athene, at Corone

in Messenia, bore a crow in her hand ; or that this bird was an attribute of Apollo, and rested upon his lyre ; or that ravens brought bread and flesh to a prophet of the Jews. On a Gnostic gem is a nude god holding the bay-branch of Apollo, associated with a crowned bird who bears a caduceus, and whom a Hebrew inscription calls a raven. Ravens are frequent on Mithraic monuments, and the corax was a figure that served in the rites of a Mithraic cave, where the superior priests were called lions, and the inferior ravens. Hence the rites themselves were designated as *Leontica* and *Coracica*. Indeed, these birds are everywhere spoken of as full of wisdom. "Hornklofi's Raven-song" tells of "a fair-haired, white-throated damsel who had the look of a wise Walkyrie that despised wedlock, a keen Finnish maid who knew the tongue of birds" (*Corp. Bor.* i, 256). The "Lay of Righ" narrates how his sons grew up and "busied themselves with breaking horses, rimming shields, smoothing shafts, and planing ash-spears. But the youngest of them knew hidden things and the secrets of life. He could [of course by magic] blunt swords, and still the sea, and understand the language of birds" (*Ibid.* i, 242).

Sigurd, who had killed the serpent Fafni, the guardian of a gold-hoard, and was roasting the monster's heart for Regin, the serpent's brother, burnt his fingers and hastily put them to his lips ; and when he had tasted the dragon's blood, immediately he understood the voice of birds. And some that were in the tree overhead happened to be conversing about him and his prospects, and he profited greatly by what he then heard.

Atli was helped by a talking bird, who asked, "Hast thou seen Swafni's daughter, the fairest maid in this happy world ?" "Say on, thou wise bird," said Atli. "I will," responded the bird, "if I may choose what I like out of the king's palace." "Yes, only choose not his sons, nor their wives" [for that would mean their death]. "No ! I will choose temples, and high altars, and horned kine." The allusion is to the great slaughter that took place at sacrificial feasts, when birds of prey greedily devoured the offal. At such a banquet was engaged "the poll-feathered raven, sworn brother of the eagle," who, when a question was asked him, "shook himself, and wiped his beak, and made answer."

But to fatten on human flesh was their chief delight. "Quoth a raven to a raven as he sat on a lofty bough, 'Some tidings have I for thee. This newly born son of Sigmund hath eyes that flash like a hero's ; a friend of the wolves is he, so we may be of good cheer.'"

Woden was the ravens' friend because he gave them the slain bodies of his foes. They were called "his swans, whose wine

was blood." The exultant hymn of Lodbrók, a Scandinavian king, sings how "we dealt wounds for yellow-footed fowl and for famished wolves; we gave the falcon its full, and made it our guest at the battle. Glad grew the brethren of the hawk, and a bloody prize was given to the raven." Indeed, war was so frequent, and burial of the slain so rare, that birds of prey acquired a new instinct and gathered together at the mere mustering of men, at the sound of their voices and of the clash of their arms as they marched.

The civilisation of the Baltic races ever lagged behind that of the Mediterranean, and was late in reaching the conception, long before attained by Grecian thought, that while birds, who themselves were great travellers, might by their own migratory skill guide men on their way, yet in revealing other kinds of knowledge they were only the intermediaries of the gods. Xenophon, in his "Recollections of Socrates," affirms that "those who consult omens do not imagine that birds know what is advantageous for them; but that the gods, by such means, rightly signify what will be so. People allege that they are instructed by birds; but Socrates declared that the admonition came from the divinity" ("Xen. Mem.," I, i, 3, 4).

But the lively scepticism of some of Xenophon's contemporaries was disposed to go a little beyond what was reasonable, and the critical temper as well as the gross credulity of the time, four hundred years before Christ, was wittily displayed by Aristophanes. Two men come upon the stage in search of a habitation. One of them is guided by a crow, the other by a daw. *Evelpides*: "We must go forward to yonder tree." *Pisthetairos*: "A plague on thee and on thy bird! Mine commands us to go back. To think that, at the mercy of this vile crow, I should have gone already more than a hundred miles!" *E.*: "Ay, and this daw has led me by the nose till scarce a shred is left on my sandals. Look at this fowl of mine! How he yawns and stares about him." *P.*: "And mine snaps his beak in disdain." *E.*: "When Priam was introduced on the stage he was always attended by a bird." *P.*: "And Zeus carries an eagle upon his head, and his daughter an owl, and Apollo a hawk." *E.*: "By Ceres, 'tis true. But why is this thus?" *P.*: "Why? In order that when men sacrifice, and submit the entrails of the victims to the gods, the birds may have the first picking of them, before even Zeus himself. Birds point out to those who consult them mines and minerals, and show their diviners how to make commerce lucrative, and tell mariners when to sail. And they discover to men treasures of silver which their ancestors hid in the ground, for they always know where such things are concealed; as the proverb says, 'No one knows of my treasure but

the little bird.' Art thou aware that that croaker the raven lives for five generations?"

And then the *Chorus* fills up the measure of derision: "When the crane takes her flight across the Mediterranean, 'tis seed-time, and the sailor begins to season his timbers. The kite tells you when to shear your sheep, the swallow when to throw off your warm cloak and buy a light one. No prediction can be made without the help of birds. In every sound, even in a sneeze, a bird's voice is detected."

These wholesome gibes may have served to open the eyes of those who were the blind spoil of priestly augurs, but they tended to obscure the fact that mankind had learnt much from the wisdom of birds, whose extraordinary powers of flight and vision had been used by seamen for the purpose of discovering the proximity of land or the direction in which it lay, and whose annual passage oversea necessarily proved to observant minds the existence and location of unknown countries. It is averred (Humboldt and Gätke) that in the Andes a condor has been seen flying at the height of 40,000 feet; and we are told that the northern blue-throat makes its way from Egypt to Heligoland, a flight of 1,600 geographical miles, in a single night.

The *Columbæ* remain to be considered. They have a reputation for conjugal fidelity. During the breeding season the sexes exhibit a most tender affection, and they produce two broods in the year. Their wisdom is chiefly shown by the faculty that some species possess of finding their way home from distant places. According to Darwin, the modern homing pigeon is descended from the Persian messenger dove, first brought to Europe by Dutch sailors. It has been said that at the moderate elevation of 430 feet a bird can see twenty-five miles ahead. This estimate is much too low. When the atmosphere possesses what meteorologists call "visibility," the unaided human eye, at an altitude of 300 feet, can easily detect coastlines across the sea at a distance of seventy miles.

It must be observed that the words *dove*, *culver*, *columba*, and *κόλυμβος*, all mean a diver or swimmer, and it is said that these names were bestowed on pigeons because of their "peculiar mode of flight." This is imaginary. Their mode of flight does not in any wise suggest the action of swimming or diving so forcibly as to single them out for a name from hawks, larks, seagulls, and all the fowls of heaven. They have, however, one distinguishing habit so peculiar as to warrant a generic designation. In their mode of drinking, they differ remarkably from all other birds, for instead of taking up a small quantity of water in the mouth, and then swallowing it by raising the head,

they immerse the bill in the water and drink without stopping till they are satisfied.

In reconsidering the etymology, we find that *κολυμβάω* may be used with the modified meaning "to dip," since Thucydides and Plato employ the stronger form *κατακολυμβάω* for "diving," and that the Eng. *dove*, the A.S. *dufa*, and the Goth. *dubo* have "dip" as well as "dive" for their congener. The A.S. verbs *dippan*, *doppettan*, mean "to dip," "to plunge," "to immerse." The A.S. *dop-fugel* is the moorhen, which is a true diver, as are the dipper, or water ousel, and the dab-chick, or little grebe, called in Dorset die-dapper. But the A.S. *dob-enid*, or dipping-duck, is the gannet, which is quite incapable of true diving or swimming, and takes its fish by flying over the sea and suddenly dropping upon any that come in sight. "Dip" and "dive" are therefore etymologically convertible, and doves are fowls that are named from the fact that they dip the beak in drinking.

By the Greeks doves were ranked with wise birds. Dionysius of Halicarnassus, who wrote in the first years of our era, states that oracles were obtained at Dodona through pigeons, which, sitting on oak-trees, revealed the will of Zeus (i, p. 12, Sylburg, as quoted by George Smith). Sophocles (B.C. 440) speaks of two oracular doves (Trachiniae, l. 169), and Herodotus, who wrote a little before this, was told by the priestesses at Dodona that a black pigeon flew there from Thebes, in Egypt, and sitting on an ilex, proclaimed in a human voice that an oracle must be erected for Zeus (ii, 55). The word *πέλειαι*, here used both for the doves and their attendant priestesses, is the one employed for pigeons by most early writers, including Homer, Sophocles, Euripides, and Aristophanes. Its relation to the adjective *πέλος*, dusky or blue, led Herodotus to conjecture that the first priestess was a black woman. But the word could only show that the birds were of a bluish colour, like those we term rock-pigeons. Varro, the Roman, who wrote on agriculture about fifty years before Christ, distinguished three kinds: wild, tame, and mixed. The *miscellae*, or mixed, show us that already there was a tendency to the variation that is now so marked; the *agrestes*, or wild pigeons, were of a blue colour; and the *cellares*, or tame pigeons, were doubtless those which the Greeks designated by the term *περιστεραι*, used by Sophocles, Herodotus, and Xenophon, and exclusively by the Septuagint and in the New Testament. The dove-cote of Plato was *ὁ περιστερεών*.

Turning for a moment to Polynesia, it appears that in those islands birds were ever regarded as the special messengers of the gods to warn men of impending danger, each tribe having

its own feathered guardians (Gill, "Myths," p. 35). "Like the outstretched heavens," says a song, "are the wings of the warning bird. Ah! that long curved beak! 'Tis a chosen bird from some other land that comes to warn thee. Stand erect, ye divine ones, and say whence ye came." This invocation is probably addressed to frigate-birds, sacred in the Solomon group, in which the spirits of deceased men of renown were believed to dwell. In Manjara a species of blackbird was regarded as the incarnation of the god Moô, and led the way on marauding expeditions. A red pigeon assisted Māui in the discovery of fire. Rori was guided by birds. "The cooing of doves [*kukupa*=a pigeon] was his music, a warning over his head. In pity they called to him, sent to save him by the spirit of the Wild Black Rocks."

In Captain Cook's happier days the natives tried to delay his departure, and besought the lord of the winds to send forth some bird to settle on his shoulder, as the expression of a divine wish that he should remain (Gill, "Darkness to Light").

A pigeon was the pet bird of Tangaroa. It was in reality one of the gods. It rested on the island of Atiu, and as it sipped the cool water at a grotto saw therein a female shadow of great beauty. The pigeon readily embraced the lovely form, and then flew away. The child thus originated was called Atiu, "the first-born," and the natives of the island regard themselves as descended from the gods (*Ibid.*).

The amatory disposition and the fecundity of the dove made it a suitable associate for a goddess of love and maternity. In the East the favourite sacrifice to Istar, Astoret, or Astarte, was this bird. And it is a highly significant fact that young pigeons and turtledoves were sacrificed to Jahveh, under the Levitical law, as an atonement for the impurity of childbirth, whilst similar offerings were brought by the Virgin to the Temple at Jerusalem after the birth of Christ.

According to Hyginus, chief of the Palatine Library, a collector of mythological legends, and one of Ovid's friends, the Greeks thought that an egg fell from the sky into the Euphrates; fishes carried it to the bank, where a dove sat upon it and hatched out Aphrodite ("Fabulæ," 197).

Diodorus the Sicilian, a contemporary of Hyginus, relates that "at Ascalon, in Syria, is a temple dedicated to the famous goddess Derceto. She, having given birth to a daughter, thereupon in a paroxysm of remorse killed its father, abandoned the child, and destroyed herself. The infant was, however, preserved and nourished by a great flock of pigeons, who not only nestled upon her and kept her warm, but constantly fed her with milk, which they brought in their beaks from the shep-

herds' huts. When she was a year old they began to feed her with cheese; but the shepherds, finding their cheeses pecked out, followed the birds, and discovered a very beautiful child, whom they brought to the king's herdmaster; and he adopted her and called her Semiramis, a name derived from pigeons, which the Syrians ever after adored. In the end, she surrendered her throne to her son and disappeared, metamorphosed into a dove, as if she had been translated to the gods, according to the words of the oracle of the temple of Ammon" (ii, 1).

On coins found in Cyprus, belonging to the Union of Cypriote Towns and bearing the legend *Κοινὸν Κυπρίων*, appears the temple of Paphos, on which rest the holy doves of Aphrodite. Elsewhere, on sculptured monuments, they hover round goddesses; Astarte presses them to her bosom; priests and sacerdotal women carry them. They were encouraged to breed in sacred precincts. A terra-cotta model of a temple, found at Dali, has in its upper storey a multitude of pigeon-holes. A dove that was believed to be the messenger of Mohammed used to perch upon his shoulder. And to-day, in the courtyard of the great mosque at Mecca, are more than two thousand of these birds; and to feed them is the duty of all worshippers.

Here, then, we have a vast mass of popular belief and practice, of great antiquity, that confronted Christianity from its birth onwards all through the Middle Ages; and we may confidently expect, on *à priori* grounds, that a careful investigation will discover many examples of a religious overlap on points of resemblance; that the myth of wise birds has influenced, if not Christian creed, at any rate Christian iconography.

When we enter the catacombs of Rome we find that the dove, symbolically used, had several meanings. Usually it was the emblem of peace, for it often bears the legend PAX; and it often carries an olive-branch in its beak, reminding us of the promise to Noah, though it also recalls the Diluvian Hero's Wise Bird. The injunction, "Be ye harmless as doves," made them the sign of innocence; and the Virgin, with the inscription *Maria*, is placed in an attitude of prayer between two pigeons, not perhaps without a reminiscence of Semiramis. They appear to stand also for pious Christians, or for the souls of departed saints, since a dove is depicted as resting on each arm of the cross; and Tertullian (A.D. 193) calls the sanctuary *columbæ domus*.

Neither had the significance of the dove in relation to maternity altogether vanished from later times. The Immaculate Conception was often symbolised by a pencil of light that,

streaming from a dove, as the Holy Ghost, fell upon the Virgin; and we read in the Blickling Homilies (A.D. 979) that "the Holy Ghost abode in the noble body, in the best of all bosoms, in the beloved storehouse; and in that holy womb He [the Holy Ghost] abode nine months, and then the queen of all maidens gave birth to the true Creator and Consoler of all men, the Healer of all the world, the Preserver of all spirits, the Helper of all souls, when the gold-flower came into this world and received a human body from St. Mary, the spotless Virgin."

During mediæval times, in both Eastern and Western Churches, a vessel shaped like a dove, and called a peristerion, was suspended before the high altar by a chain from the roof of the edifice. It opened on the back, and in the body of it was a depository for the Blessed Sacrament. In the year 370 St. Basil the Great reserved the Host in a dove made of gold; and in the year 474 Perpetuus, Bishop of Tours, left by will a silver dove to Amalarius, a priest. In England this receptacle was called a culver. One made of "latyn," a sort of brass, is mentioned in the churchwardens' accounts of St. Dunstan's, Canterbury, in 1500; and in 1596 a culver was repaired of the church of Kirton-in-Lindsey.

The etymological association of its name, gives the dove a special significance as a symbol of baptism, and may have been one of many reasons for its sculptured presence on dip-stones or fonts.

In mediæval bestiaries a white dove denotes the Holy Ghost, but one of a purple colour is declared to signify Jesus the Son of Mary; and the dragon is affirmed to be afraid of the doves upon the "Arbor pereclixion," or tree of life.¹

It was at one time a common belief in this country, due doubtless to the sanctity of this bird, that an easy death was impossible on a bed stuffed with pigeons' feathers.

But the dove claims especial recognition in its character of a wise bird. We are told by Roger of Wendover, who relates the assassination of King Kenelm, that a white pigeon—*candida columba*—carried a letter—*charta quædam*—containing the news, to Rome, and dropped it on the altar of the blessed Peter. Every Good Friday the Sangrael was visited by a white dove, that, descending from heaven with an oblation, laid it before the holy vessel, which thereupon gave oracles in miraculous characters, that appeared for a few moments on the surface of the bowl and then vanished away. The dove was the sign of inspiration and of the endowment of tongues, and was especially

¹ "Arborem Pereclixion . . . dicunt a crudeli dracone tueri. Istiusmodi physici de columba docent." *Vita B. Columbæ Reatinæ*. Περικλύζω = washed all round (like an island).

chosen as the symbol of the Holy Ghost, whose seven gifts are all intellectual, namely, wisdom, understanding, counsel, fortitude, knowledge, piety, and veneration (Isa. xi, 1, 2, 3). Accordingly, in the thirteenth and fourteenth centuries, Christ is represented as receiving inspiration from seven doves.

It may be objected that the chief function of the Holy Ghost is indicated by His title "the Paraclete," a word which is usually rendered "the Comforter." But the Greek term *Παράκλητος* arose in courts of justice and meant "an advocate." Further examination shows that the Paraclete was to teach all things—*ὡμᾶς διδάξει πάντα*—and bring things to remembrance. He was to convince the world of error and justice: *ἐλεγξει τὸν κόσμον περὶ ἁμαρτίας καὶ περὶ κρίσεως*. And *ἐλέγχω* is a word used of arguments and proofs, whilst *κρίσις* means trial as well as judgment.

The Icelandic New Testament translates *Παράκλητος* into *Huggari*, which is etymologically equivalent to *Huginn*, Woden's raven. Indeed, the overlap we are considering necessarily increased as Christianity interpenetrated the religion of our Teutonic forefathers. Augustine, the apostle of the English, died at Canterbury in 605; Ansgar, the apostle of the North, who was born in 801, was a German monk, who prepared an illustrated book, the "*Biblia Pauperum*," for the instruction of the unlearned. In this he taught that as the Law was given from the top of Sinai, so a new law was delivered, when fire appeared above the faithful, on the day of Pentecost. And in the Benedictional of St. Ethelwold, Bishop of Winchester, of the tenth century, fiery tongues of inspiration issue from the beak of a dove and stream upon the apostles.

One of the earliest redditions of St. John's Gospel into the Anglo-Saxon tongue, was made from the Latin, it is thought by Aldhelm, Bishop of Sherborne, who died in 709. The opening sentence runs thus: "*In principio erat verbum, et verbum erat apud Deum, et Deus erat verbum.*" This was literally rendered: "In the beginning was the word, and the Word was with God, and God was that Word." Raw converts, ready enough from their preconceptions to regard the Holy Ghost as the Spirit of wisdom, whose symbol was a Wise Bird, naturally identified the Verbum with the Dove, and therefore with the Third Person of the Trinity. When the Lindisfarne version of the Gospel was produced, in 950, it is clear that an attempt was made to correct such a blunder, for the same Latin words were rendered, "In the beginning was the Word, and the Word, which was God's Son, was with God the Father; God was that word."

The writings of St. Basil the Great, of the fourth century, were

inspired by a shining white dove, that was seen to alight upon his shoulder; and a statue of the thirteenth century, in the cathedral of Chartres, shows a dove, with a cruciferous nimbus, resting on the shoulder of Pope Gregory and whispering in his ear (Didron, "Christ. Icon.," i, 448)

Moreover, we may recognise the influence of Woden's raven upon the eagle of St. John; for the Evangelist is often represented, not in the form of an eagle, but in the company of one. In a "Manual of Painting" of the twelfth century, it is enjoined that "the semblance of the eagle must direct its gaze towards St. John, because it indicates the inspiration of the Holy Ghost." On the runic cross of Bewcastle, in Scotland, of the seventh century, an eagle on the wrist of St. John is apparently holding converse with him (Fig. 5), whilst on the runic cross of Ruthwell, of the same country and century, an eagle climbs the Evangelist's thigh to whisper its tidings (Fig. 6).

Worsaae, in his work on the "Industrial Arts of Denmark," says (p. 131), "The idea of a divine trinity must have been extensively diffused throughout the North during the Bronze Age." This conception of a trinity was, however, henotheistic; when any member of the triad was worshipped apart he was adored as supreme. The sign of Woden was the triskele; the trinity of Thor was suggested by representing him as a man with three heads; and the symbol of Frey was the solar cross, a token of omnipotence. On a runic stone in Gotland the Three are carved in a group. On one side is Woden, with his spear; in the midst is Thor, his divine son, begotten of Fjörgyn, Mother Earth; and on the other side is Frey, with a large bird, which bends its head over him. Worsaae calls this bird a goose, but it may well be a crane.

For a long period the Christian Church, in representing the Trinity, indicated the Father by a right hand, the Son by a cross, and the Holy Ghost by a dove. Full, personal effigies began to be made about the twelfth century, and became very frequent by the close of the fifteenth century. It has been observed by Didron that for one Italian or for two Romanesque examples there are thirty of Gothic origin. We see the group of Three Persons; and sometimes the Third has a dove resting on His head, as the crane once bent over Frey. At other times the Third Person grasps a dove by the feet, precisely as it was carried long ago by the priest of Aphrodite, or it is held aloft on the wrist like a falcon by a hunter (Fig. 7).

When the Holy Ghost does not appear personally in representations of the Trinity, but symbolically by a dove, then in the south of Europe the bird seems to be escaping from the mouth of the Father, or is seen with its wings "proceeding"

one from the lips of the Father and the other from the lips of the Son, who are therefore placed side by side.

But often in the North the dove stands at the Father's right hand (Fig. 8), or perches on His shoulder, or descends upon Him in flight (Fig. 9,) and in all cases approaches its beak to the Father's right ear; and so again suggests the verbum, the divine wisdom, the Wise Bird.

In Protestant countries few monumental relics of this myth are to be found except those that remain from pre-Reformation times; but in some parts of Sweden the figure of a dove still swings above the pulpit of the preacher, and in this country the support of the lectern continues to be an eagle of brass.

And we arrive, once more, at the old conclusion that many civilisations, many systems of religion, have contributed to the material and spiritual possessions with which "the heirs of the ages" have been endowed.

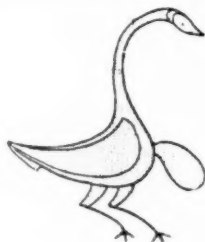
February 9th, 1897.

Description of Plates XIV and XV.

- Fig. 1.—Ba-bird, from the Fifth Memoir of the Archaeological Survey of Egypt, "Beni Hasan," Part III, Plate II, Fig. 3.
- „ 2.—Adjutant-bird, *Ciconia argala*, "Reptiles and Birds," by Figuier, pub. Bickers and Son, p. 358.
- „ 3.—Bird figured on an amphora from Ialysus; "Mycænic ceramics": "History of Art in Primitive Greece," by Perrot and Chipiez. Pub. Chapman and Hall. Vol. ii, p. 377.
- „ 4.—Fragment of Mycænean vase found near the Lions' Gate. "Mycæne and Tiryns," by Schliemann. Pub. John Murray. Plate XX, No. 195.
- „ 5.—A group from the Bewcastle Cross. Stuart's "Sculptured Stones of Scotland," ii, Plate XXIV.
- „ 6.—A group from the Ruthwell Cross. George Stephens. Pub. John Russell Smith. Plate II, Fig. 2.
- „ 7.—Sculptured group, interior tympanum of south door of Tarrant Rushton Church, Dorset. The stone is not architecturally *in situ*.
- „ 8.—Sculptured group, exterior tympanum of south door of Pontorson Church, Normandy.
- „ 9.—Sculptured group, west front of tower of Abbotsbury Church, Dorset. The stone is not architecturally *in situ*.



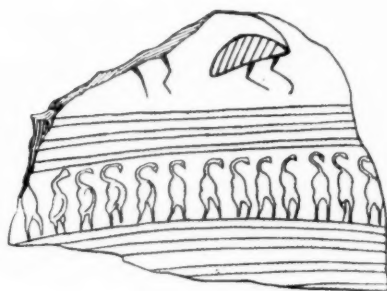
1



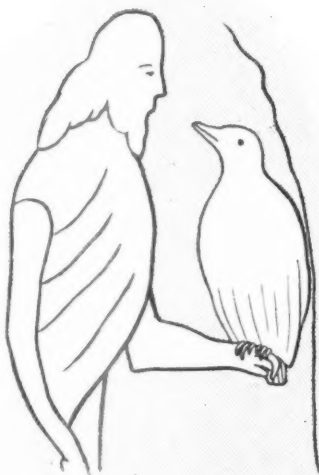
3



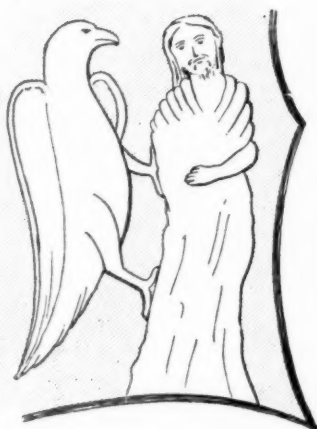
2.



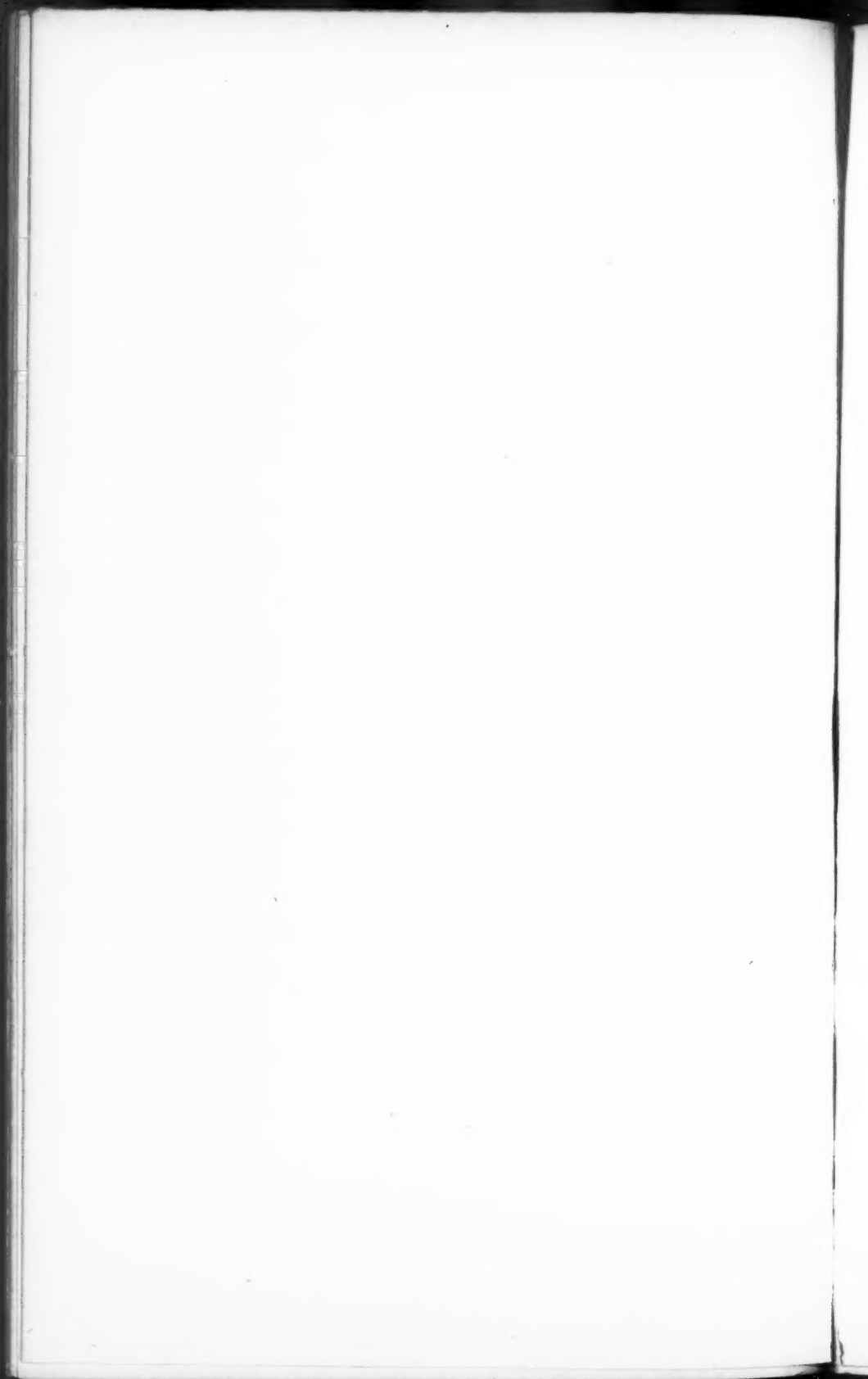
4.

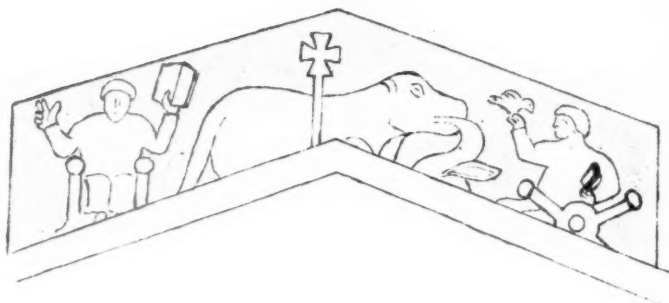


5.

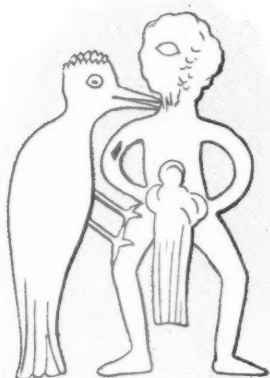


6.

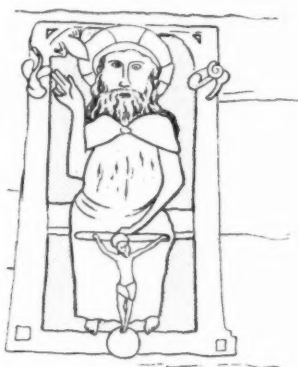




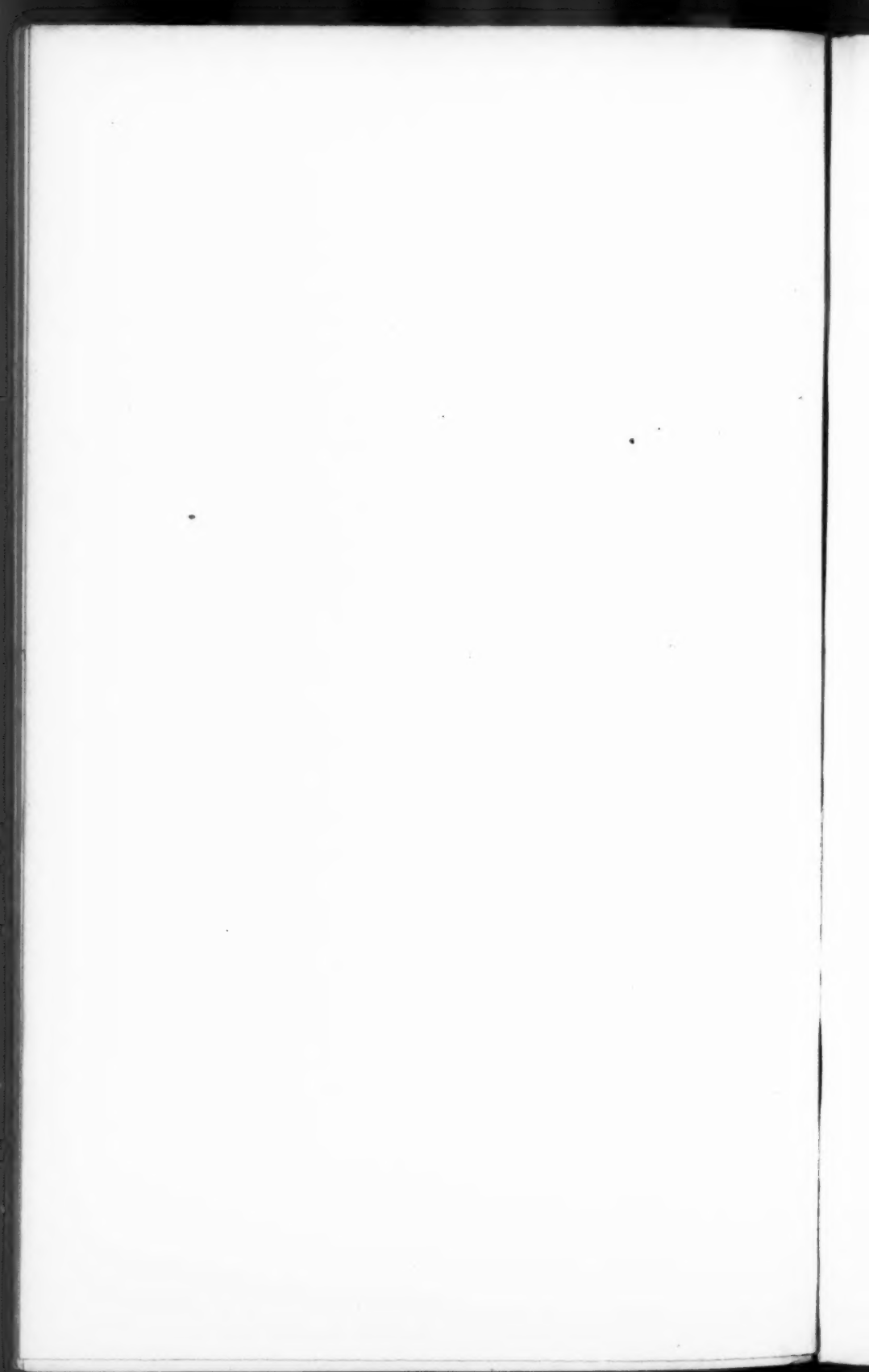
7.



8.



9.



*On the EVIDENCE for the EFFICACY of the DIVINER and his ROD
in the SEARCH for WATER.* By T. V. HOLMES, F.G.S.

WHILE the study of the normal has long been one of gradual and continuous progress, that of the various departments of the abnormal has hitherto been accompanied by very different results. For in the latter case we have had a tendency, not to the slow development and modification of views in accordance with increasing evidence, as in botany or geology, for example, but to an acceptance or rejection of the mass of real or alleged facts, with little or no sifting of details. An age unduly credulous of marvels is succeeded by another to which anything abnormal is considered contrary to common sense, and consequently as not needing any examination. In these oscillations we see those violent actions and reactions which invariably occur whenever the factors of public opinion are the feelings and preconceptions of men generally, rather than the comparatively dispassionate researches of scientific observers. And as the evidence for the abnormal is necessarily irregular in occurrence, and often peculiarly difficult to obtain at first hand, and its treatment, if obtained, depends to an unusual degree on the preconceptions of the individual obtaining it, we must long expect to find disagreements among the most careful and capable inquirers in this department, of a magnitude not to be met with in other fields of study.

The great development of natural science has made the second half of this century remarkable as an era of free inquiry into the various departments of the abnormal, as well as into other subjects. One result of this has been, that questions such as that of the alleged special powers of the diviner with his rod, in making the search for water a success, are fully and freely discussed, and various opinions expressed thereon in a scientific spirit, a quality till lately wanting in such discussions. And the diviner, instead of being looked upon by the mass of educated people as an example of lingering superstition, is now openly consulted by squires as well as by farmers, as paragraphs in country newspapers often testify. With one exception, however, I have not yet met with any account of the proceedings of a diviner from the pen of a field geologist, who would evidently be the most useful critic in such a case. For, even if much prejudiced for or against diviners and their rods, he would at least be able to note the geological character of the ground, and those circumstances generally, which are un-

likely to be noticed by other observers, yet which constitute the only evidence, favourable or the reverse, to the hypothesis of the possession of some special faculty on the part of the diviner. Of course, in the great majority of cases, the field geologist is very unlikely to know when these experiments are about to take place, as the diviner is usually consulted by persons, whether educated or not, who do not realise the bearing of geological knowledge upon questions of water supply. The following remarks are simply notes by a field geologist on various recorded cases in which diviners have been consulted. I may add, that to me abnormal sensitiveness to the proximity of water seems quite as *possible* as abnormal sensitiveness to the action of some special drug, or to the presence of some particular animal, of which many curious examples are known.

Mr. Andrew Lang, in "Custom and Myth," has a chapter on the divining rod. He remarks that in all countries rods or wands have been supposed to possess a magical power; but notes that Pliny (though extremely fond of marvels) when he describes the various modes of finding wells of water, says nothing about the divining wand. This suggests, to say the least, that water-finding by its agency was much rarer in Italy in Pliny's time than it is in England to-day. Mr. Lang points out that the Royal Society attempted to deal with the problem of the rod in 1666, but without success. This is not to be wondered at, as the philosophers of the seventeenth century did not particularly concern themselves with the real or alleged facts, though they devoted much thought to the formation of hypotheses to account for them. We learn that two centuries ago, ecclesiastics were particularly fond of using the rod in the search for water, and that "the Maréchal de Boufflers dug many wells and found no water, on the indications of a rod in the hands of the Prieur de Dorenic, near Guise." Mr. Lang also notes that while Bleton, the great water-finder of the eighteenth century, declared that the physical sensations of the searcher communicated themselves to the wand, the African theory is that the rod is inspired and influences the man; and that "Paramelle, who wrote on methods of discovering wells, in 1856, came to the conclusion that the wand turns in the hands of certain individuals of peculiar temperament, and that it is very much a matter of chance whether there are, or are not, wells in the places where it turns."

But the most important case, as evidence, mentioned by Mr. Lang, is that to which he refers as given in the "Quarterly Review" (vol. xxii, p. 374, 1820), but which he dismisses in a few lines describing the agitation of the diviner and the twisting of the rod in her hands. On consulting the "Quarterly Review"

in search of additional details, I learned that the lady in question (styled "Lady N." in the Quarterly, but known, Mr. Lang says, to have been Lady Milbanke, mother of the wife of Byron) had discovered her water-finding faculty at the age of sixteen. She was then on a visit to Provence, and the owner of the château at which she was staying, employed a peasant with a twig to discover a water supply, and she found, "to her amazement and alarm," that she had the same faculty. On returning to England she often exercised her gift, though in studious concealment. But when Dr. Hutton—the eminent mathematician, not the famous geologist of that name—published Ozanam's researches in 1803, where the effect of the divining rod is spoken of as absurd, "Lady N." wrote to him on the subject; and a few years afterwards she went at Dr. Hutton's particular request to see him at Woolwich, and, "she then showed him the experiment, and discovered a spring in a field which he had lately bought near the New College, then building. This same field he has since sold to the college and for a larger price in consequence of the spring." The narrator adds, *inter alia* :—"It is extraordinary that no effect is produced at a well or ditch or where earth does not interpose between the twig and the water." It is satisfactory to be able to add that the narrator is spoken of in the Quarterly as a person in whom the most implicit confidence may be placed.

The special importance of this case lies in the fact that the spot at which the "spring" was discovered, is sufficiently identified, and that there can be no doubt about the geological nature of the ground there. The "new college" is evidently the Royal Military Academy on Woolwich Common, at which Dr. Hutton was professor of mathematics (1773–1806). Now the surface of Woolwich Common between the Military Academy and the Artillery Barracks and Rotunda (northward) consists of Blackheath pebble beds; while from the Academy southward the pebble beds become covered with a gradually increasing thickness of London clay. Whether the spot at which the lady discovered the water had pebble beds at the surface, or they were covered by a few feet of London clay is immaterial, as water would be found only towards the bottom of the pebble beds. And as water percolates evenly and freely through them, and they are lying almost perfectly flat, water would be found thereabouts at very nearly the same depth wherever the pebble beds are uncovered, and at a greater distance from the surface as the thickness of the London clay above increased. It is therefore obvious that whatever influence may have caused the lady's agitation and the twisting of the rod in her fingers, it could not have been a peculiar and special near-

ness of underground water at that spot. In this instance, too, there can be no suspicion that she was trying to give herself a reputation for an abnormal faculty, while her movements were really the result of knowing that water was almost certain to be found at no great depth in a bed of gravel. We learn also that the most perfect integrity is quite compatible with complete, though unconscious, self-deception. In short, this case is one best explained by the conclusion of Paramelle, that "the wand turns in the hands of certain individuals of peculiar temperament, and that it is very much a matter of chance whether there are or are not wells in the places where it turns." Records of experiments with the divining rod show many apparently similar cases, though the want of sufficient geological details prevents any useful analysis of them.

There is a chapter on the divining rod in Mr. Baring Gould's "Curious Myths of the Middle Ages." We are there informed that in that period, belief in the divining rod became fully developed, and that it was "believed to have efficacy in discovering hidden treasures, veins of precious metal, springs of water, thefts and murders." He adds that, "the first notice of its general use among late writers is in the 'Testamentum Novum,' lib. 1, cap. 25, of Basil Valentine, a Benedictine monk of the fifteenth century." Mr. Baring Gould gives a full account of the services of the well-known Jacques Aymar in the discovery of thefts and murders two centuries ago. Water-finding occupies a very subordinate place in the examples given, but we learn that on one occasion the famous Jacques Aymar, when in quest of a spring of water, found the rod turn sharply in his hand, but that, on digging, not water, but the body of a murdered woman was found. And that Bleton, who fell into convulsions whenever he passed over running water, failed signally when brought to Paris, "to detect the presence of water conveyed underground by pipe and conduits." But the powers both of Aymar and of Bleton failed when they came to Paris. A few instances are mentioned of the search for water in the present century, by means of the divining rod in England and elsewhere. Illustrations are also given showing the various ways of holding the rod, which was usually of hazel.

In the "Gentleman's Magazine Library" (Vol. "Popular Superstitions," p. 148), we find a few contributions about the divining rod, their dates being from the year 1751 to 1819. In the earliest account the writer remarks:—"So early as Agricola (16th century) the divining rod was in much request, and has obtained great credit for its discerning where to dig for metals and springs of water; for some years past its repu-

tation has been on the decline, but lately it has been revived with great success by an ingenious gentleman," etc. Then follow directions for choosing and holding the rods or forked twigs, which may be of hazel, willow, or elm; hazel being preferred. The mode given as that in which the rod should be held is one that must have been very fatiguing and likely to cause changes of position from mere weariness. For each hand grasped one of the two ends of the forked twig, the palms of the hands being upwards and the arms being close to the sides. This position is stated by Mr. Baring Gould to be that usually, though not invariably, adopted. The cases mentioned have no interest to us as evidence.

In the "Proceedings of the Society for Psychical Research," Part V, p. 73 (April, 1884), there is a "Report on Wells sunk at Locking, Somerset, to test the alleged power of the Divining Rod," by Professor W. J. Sollas, and a paper on "The Divining Rod," by Mr. Edward R. Pease, who gives an account of experiments made by himself and other members of the Psychical Research Society, and reviews the evidence collected by Mr. E. Vaughan Jenkins, of Cheltenham, within eighteen months, from persons well acquainted with the facts. Mr. Pease considers that this evidence tends to show "that the power of certain persons to find water when experts fail is widely believed to this day, and is utilised by practical men to whom the finding of water is a business matter." Secondly, "that this power does not depend on superior knowledge of the locality." Thirdly, "that the power does not depend on geological or quasi-geological knowledge or instinct." Fourthly, "that the power is not only shown in finding spots where water is, which might be explained by supposing that there was water everywhere in that region at that depth, but spots where it is not." Mr. Pease admits that "some allowance must be made for the fact that most of our evidence has reached us from correspondents obtained through the diviners themselves.

In the first of Mr. Pease's experiments we learn that the diviner walked about the garden and fields, "and located numerous springs." But when blindfolded and taken over the same ground it was clearly observed that "the rod did *not* move with the dowser blindfold in spots where, just previously, he had located springs." And in attempting to find metal hidden under plates the same diviner succeeded once and failed twice. In the next experiment a lady was the diviner, and was taken over the same ground as in the first case, but with different results, and when blindfolded, she did not confirm her previous indications. The next case mentioned is that on which Professor Sollas reported, and the only one I can find in which the ex-

periment was watched by an experienced geologist. Passing over many points of interest for the sake of brevity, I can only state here that a field was selected on the alluvial flat between Locking and the Bristol Channel. On this the diviner was to indicate two spots, one beneath which water would be found, and another where it would not. Mr. Pease requested the diviner to work blindfolded, but to this he refused to consent. Professor Sollas noticed that he made very good use of his eyes, and walked direct to one side of the field without using his rod, though he then took it in hand over a line of march 20 or 30 paces long. Ultimately he selected a spot about 20 paces to the north of a ditch, as that where water would be found, and another, 15 feet north of this, where it would not. Professor Sollas remarks that sinkings had frequently been made at various spots on this great alluvial flat, and that he consequently knew that sand would be met with in both wells, and water would be found in both. He visited the wells during the sinking and noted the progress made. At the close of the experiment the water stood in both wells at precisely the same height, viz., 5 feet 4 inches below the level of the field. The diviner (or dowser) attributed the water in the well that (according to his view) should have been dry, to an overflow from the other well. But in that case, as Professor Sollas remarks, the strata between the two wells were evidently water-bearing, and furnished water to both. Consequently the well that should not (according to the diviner) have contained water, would have been supplied with it had the other not existed. In fact, he adds, the underground water is not concentrated anywhere, but diffused throughout the alluvium.

In addition to the above cases, which comprise all those in which the powers of diviners were tested by experiments conducted in a scientific spirit, Mr. Pease gives a list of 48, in which diviners were more or less successful in various localities. And fuller particulars of the more remarkable of these cases (which were collected by Mr. Vaughan Jenkins) are given in a second appendix. It is impossible to give a satisfactory analysis of any of these cases, inasmuch as we have not the whole of the data necessary for that purpose. Certain facts of more or less interest are given, but it would be necessary to know many geological and other details in addition before one could come to a decision such as may be obtained from the experiment reported upon by Professor Sollas. I note, however, that in one case (No. 13) the narrator says that he and the diviner went "to a spot from which he (the diviner) could see the contour of the hills (about a mile distant from the house) from which most of our water comes, showed him what spring we knew of,

and told him to choose for himself the best part to try for more." They walked much about the hillsides, finding no water. It was then late, and the diviner was becoming exhausted, as might be expected after his walk over the hills. The narrator adds at this point:—"I felt that I had seen enough to convince me that he was no impostor, and that whatever discoveries he made were due to some force over which he had no control, not to any power he had acquired by experience or observation of making good guesses at where water was likely to be," a remark which, coming at the end of the account of their long geological ramble, seems to show a curious simplicity of mind. It was found that the gardener had nearly the same power with the rod as the diviner. And the narrator adds, that having disregarded geological opinion, and trusted in the diviner, he obtained a water supply at much less depth than geologists predicted. The geological authorities appear to have been a civil engineer, who is no more necessarily a geological authority than a landowner, and another person whose occupation is not specified. However, they had said that there was no chance of obtaining water under the house at a less depth than 120 or 130 feet, while through trusting the diviner, a supply was obtained for the kitchen garden at a depth of nearly 20 feet. An additional supply was obtained from another well, in which, "at the depth of about 28 feet the water rushed in, and rose till it stood about 8 feet deep." The details given in this case are very much fuller than in any other, yet they are wanting in just those particulars which would enable us to form a decided opinion as to the comparative merits of the geologists and the diviner. It is evident that the former ignored the supply from the shallow wells, but whether because they did not consider it wholesome, or did not know of its existence, we know not.¹ We also cannot tell whether or not a better supply could have been obtained at a depth of 120 or 130 feet, as stated by the geologists.

In another case (No. 34) a geologist had advised that a bed of mountain limestone should be sunk through and a bed of clay beneath it reached. This was done, a shaft sunk to a depth of 150 feet, and a boring 10 feet below that made. No water being obtained, a diviner advised the driving of a heading from the shaft at a depth of 100 feet, and water was obtained. These two are the only cases in which geological advice was sought.

¹ The danger arising from shallow wells in towns is so thoroughly recognised that most persons used to a water company's supply would probably look at a shallow well at a country house as a source of danger, to be avoided if possible.

In "Borderland" for October, 1896, there is an article on the divining rod. It dwells upon the doings of a diviner who first discovered his powers in 1893. It is recorded of him that "he has been known to exhibit sensitiveness to the presence of water, afterwards proved to be as much as 250 feet below the surface." He has now over forty men in his employment, and is flourishing in his profession as water finder. The writer of the article in "Borderland," "Miss X," who saw the diviner dowsing, says that, going to the nearest hedge, he cut a small forked branch, which chanced to be of birch, though hazel is considered the best wood. She remarked on this substitution, but he replied laughingly that, "in fact he could do just as well without any at all, and that the use of the twig was a mere dramatic detail of the situation so far as he personally was concerned." And we learn that when the original twig broke, the diviner "entirely dispensed with any assistance of the kind, and trusted solely, he told us, to the sensation experienced in the hand and arm." We are also informed that this particular diviner "is conscious of a feeling of 'chill' when passing over water." But when we recall the assertion that "he has been known to exhibit sensitiveness to the presence of water, afterwards proved to be 250 feet below the surface," one cannot but regret that he should be so extremely exposed to chills.¹

I now proceed to a brief criticism of the evidence afforded by the foregoing cases. Whatever may be my conclusions as to the value of the evidence, as evidence, in any given case, I have not the slightest doubt of the good faith of the narrator or of the diviner. I wish simply to point out, as a field geologist, what appears to me to be the value of these cases *as evidence* of abnormal powers on the part of the water diviner, not to deny the possibility of their existence.

To begin with the rod, and its movement in the hands of the diviner, the evidence seems to me to point to the conclusion thus stated by Mr. Pease, in the article already mentioned.

"Diviners always tell us they are certain they are not moving the rod, and even that they attempt to restrain its action. No doubt they are perfectly honest. But anyone who has had the smallest experience in psychical research is aware that such statements have no value whatever. We know by experience what care and study are required to discover whether our own hands are conspiring to deceive our intellects. We are not, therefore, surprised to find that honest dowsers are easily deceived by the unconscious actions of their own muscles."

¹ Some additional cases in which this diviner was employed are given in "Borderland" for January, 1897, pp. 91-2.

Then, it seems evident from the remark of the diviner in the case last mentioned, and from the survey of the ground, without his rod, made by the diviner in the example reported by Professor Sollas, that the rod is now felt to be necessary by the diviner, only as the cowl is necessary to the monk. Doubtless it was once thought essential in a very different fashion. We have seen that it was, and is, not invariably of the same shape, or held in the same way. Yet we also learn that the most usual rod is a forked twig, the ends of the two limbs being held by the operator, and the fragment of the main stem projecting in front. This seems to me curious, as being the exact opposite of the way in which a forked rod would be held for the purpose of warding off the effects of the "evil eye" by persons fearing that influence. Conversely it seems probable, therefore, that this way of handling the rod, when searching for water, was once considered the best, because that most likely to make the holder specially sensitive to the watery or metallic influences which were not feared but desired.

In accounts of the finding of water by a diviner nothing strikes me as more strange than the way in which water found at a certain depth is usually styled "a spring." On looking at the list of cases given as an appendix to Mr. Pease's paper I read, "Strong spring at 30 feet," while of the next case it is remarked, "Spring found at 37 feet." And, looking at the list generally, it becomes evident that "spring" is used simply as the equivalent of "water." But neither in an ordinary English dictionary nor in a manual of geology do we find the term "spring" applied to water, except when it emerges as a natural fountain from the rocks through which it has been flowing underground. To call water found on sinking to a depth of 30 feet a "spring" is therefore not only to use a highly incorrect word, but to foster thoroughly false notions as to the way in which water acts when underground. For it seems to imply that just as obvious springs occur at irregular intervals, without any apparent reason for their existence at the particular spots where they are seen, so underground water becomes concentrated at certain points beneath the surface, and is obtainable only by the man who can hit those particular spots. And these spots are supposed to be extremely numerous in certain very limited areas. Thus Mr. Pease says in the account of one of the experiments (already mentioned) which he and some friends made with a diviner:—"He first walked about the garden and fields and located numerous springs. We then blindfolded him and took him over the same ground, but the springs were so plentiful that it was not easy to ascertain whether he found them again." In the case on which Professor Sollas reports, he

naturally remarks that the underground water was diffused throughout the alluvium. But the diviner evidently thought it concentrated at a certain spot and absent 15 feet away. And the narrators of the various accounts mentioned evidently accept the view of the diviners as to the mode of occurrence of water underground. Consequently a diviner who "locates a spring" at a spot where there is a similar amount of water at nearly the same depth over a radius of hundreds of yards around, seems to be supposed to have performed a feat as great as though he had discovered the exact position of a jar full of ancient coins, known to have been buried somewhere in that parish two or three centuries ago.

Indeed, the prevalence of this view as to the occurrence of underground water seems to make a brief and general account of its real "behaviour" desirable.

When rain falls upon rocks almost impermeable, most of it finds its way into the brooks and rivers of the district and but little sinks into the ground. But if it falls upon permeable rocks such as sand, gravel, sandstone or limestone, much sinks in. It percolates easily and evenly through sand and gravel, and passes through sandstones and limestones mainly along the lines of jointing and bedding. Where a permeable rock rests upon an impermeable one and both are lying nearly flat, the rain sinking through the upper rock will be found diffused pretty evenly through its lower beds, at nearly the same level. When both rocks are dipping in the same direction, water falling upon the upper one tends to flow downwards in the direction of the dip and to appear as springs where the rock is saturated to a point above the level of the surface of the ground. In limestones, which are acted upon chemically by rain, very irregular hollows are often formed, so that the descent of water through them is often largely by means of underground channels of considerable size, and the water emerges rather as brooks than as mere springs, as in the district around Settle in Yorkshire. Springs also tend to exist here and there along the course of "faults," or dislocations of the strata, which bring a rock of one kind side by side with a rock of another. It is common when water has not been found in a limestone at a depth at which it might fairly be expected, to make headings from the shaft in order to tap joints and fissures not crossing the shaft. This was done successfully in one of the cases I have mentioned (No. 34) at the suggestion of a diviner, who thereby showed his knowledge of the course usually pursued by geologists under similar circumstances.

The nearest approximation to what might be called an underground spring is the state of things in which an artesian well

can be successfully sunk. In such cases the rocks dip so as to form a broad area shaped like a shallow basin, permeable rocks forming the surface towards the rim of the basin, and being covered towards its centre by impermeable strata. Then the permeable rocks will become saturated with water towards the centre and dry to a considerable depth towards the rim of the basin. Under these circumstances, if the overlying impermeable beds are pierced through towards the centre of the basin, and the underlying permeable rocks entered, the water saturating the latter will rise to a considerable height in the sinking or boring, sometimes reaching the surface. But artesian wells have been made common only by the growth of geological knowledge, and are obviously not sinkings in which sensitiveness to the proximity of water can be of any assistance. And I can find few records of the sinking of deep ones at a date earlier than the year 1840, though many have been made more recently. Indeed the demand for water from deep wells, on account of its superior purity and safety, is a requirement at least equally recent.

It may be worth adding that the area within which an artesian well may be successfully sunk is to be measured by acres or square miles not by square feet or yards.

But if we turn our attention (for example) to the sites of the old towns and villages on the banks of the Thames and Lea, we find that they owe their positions mainly to the presence there of a bed of old river gravel, high enough to be above the reach of floods, and affording a water supply attainable by means of pumps. A glance at the maps of the Geological Survey which show the drift, or superficial beds, will at once demonstrate this fact. There we see that though what is now London has spread over various formations, the ancient "City" is on river gravel. Looking up the valley of the Lea we see on the west side of that stream, from Tottenham to Hoddesdon, an almost continuous series of populous villages. Opposite them on the Essex side is but one old town, Waltham Abbey. And the reason for this distribution of population is evidently the fact that on the west side of the Lea there is a broad continuous sheet of river gravel, while on the eastern bank there is bare London clay (from which no water can be obtained) except at Waltham Abbey, where a patch of river gravel appears.

It is evident, therefore, that while geology as a science can hardly be said to be a century old, there must have existed from very early times a knowledge, of a purely practical kind, of the surface beds of a locality and their water bearing properties, or the reverse. When the general geological structure of a district and the relations of its rocks to those of

other districts were utterly unknown, there must have been many men who knew that gravel made a good site for a settlement, and that it was useless to expect to obtain water from a thick clay. And such men, if transported to another district, as different from their own as a chalk country from a coal-field, in geological age and structure, would soon find themselves almost as much at home among the surface beds there as among their own. For the deposits of one river valley have a strong general resemblance to those of another, and superficial gravels or clays, at a higher level, naturally tend to show the same contours, and to produce vegetation resembling that of beds of the same kind fifty or a hundred miles away. A thick clay of one geological age makes a soil like that of another of a very different period, and similar trees are likely to flourish on each. While where water-bearing beds of any age form the surface, and their dip makes them dry at their greatest elevation and full of water at their lowest, the visible changes of various kinds accompanying this lack or abundance of water are as obvious to the water diviner as they can be to the most skilled geologist, who often takes little interest in water questions of this kind.

Indeed, while this ancient practical knowledge of the best spots at which to obtain water at no great depth from the beds forming the surface, and especially from those which overlie indifferently other formations of various ages, has never waned, the rise of geology as a science tended to draw away attention from these superficial beds to those of older date. An example of this tendency is well illustrated in the maps of the Geological Survey of England and Wales. Having been primarily intended to assist mining enterprise by showing the respective ages of the various geological formations, their relations to each other, and their distribution throughout the country, superficial beds were for many years almost entirely ignored. Indeed, in mining districts, geological maps which omit superficial "drifts" are generally preferable, as to map them is to obscure more or less the general structure of the district, and the disposition of the older and more important rocks. But it gradually became obvious that in agricultural districts like the eastern counties, which were among the latest to be geologically surveyed, the "drift" formed most of the surface not merely for 4 or 5 feet, but often to a thickness of more than 50 feet. And drift maps of the eastern counties, as of other districts, may now be obtained. But it is easy to understand that the ignoring of the drift in the earlier maps of such a district as Norfolk, Suffolk and Essex must have tended to make residents in those counties think that as regards water supply for private houses, and for

persons who could not go to the expense of a deep well, geology could offer no help. In a paper in the "Essex Naturalist," for January-May, 1894,¹ Mr. George Day mentions three cases in which water diviners have recently been consulted in North Essex, the earliest of the three having been in 1891. And on consulting the Geological Survey maps of Essex, I learn from the *drift editions* that the surface in each case consists of the uppermost member of the Glacial Drift, the impermeable Boulder Clay, which forms the surface rock everywhere in that part of Essex except where the underlying sand and gravel of the Glacial period is exposed in the flanks of the valleys of the rivers and streams intersecting the Boulder Clay plateau. Of course, in such circumstances, water is usually obtained at a moderate depth—averaging from 20 to 40 feet—on sinking through the Boulder Clay to the underlying gravel. And as the towns and villages north of Chelmsford and between Braintree and Bishop Stortford—the district about which the diviners gave advice—generally lie in the valleys, on Glacial Gravel, and these valleys are very numerous thereabouts, it is a district offering as few difficulties to any practical water-finder or well-sinker as can be imagined.

A still more recent case of the search for water in Essex by means of the divining rod is reported in the "East Anglian Daily Times" of December 17th, 1896, and in the "Braintree and Bocking Advertiser" of December 16th. The account in the latter journal, being the more detailed, is given here.

"Searching for Water with the Divining Rod.

"Success of an Expert at Tolleshunt Knights.

"The Tolleshunt Knights Parish Council, which has been urged by the Maldon Rural District Council for some time past to provide a supply of water for the parish, recently resolved to apply to Mr. H. Bacon, of Newport, Essex, an expert with the divining rod. Mr. Bacon has been very successful in other parts of the county in finding water, and his services in this instance were sought mainly through the recommendation of Mr. F. Blyth, who had heard through his brother-in-law (Mr. Daniells, of Donyland), of the expert's achievements in finding water with the hazel twig. Several members of the Parish Council and residents at Tolleshunt D'Arcy and the neighbourhood met Mr. Bacon on Friday. The party was under the leadership of Mr. F. Blyth. A number of spots in Tolleshunt Knights parish were tried without success; but eventually the first indications of the presence of water were given by the rod in Mr. J. Postford's field. The way in which the twigs turned up astonished the on-lookers, some of them holding Mr. Bacon's hands, fingers, and wrists, so that there could be no deception. Watching his compass, the expert decided that the course to take was towards Stock House Farm. Continuing towards Paternoster Heath, at the top of Park-lane, he was again successful, so

¹ "Notes on Essex Dialect and Folk-lore, with some account of the Divining Rod."

much so indeed that Mr. Blyth suggested this was a likely spot for a water supply. This supply was traced for some considerable distance to the rear of Barn Hall. Mr. Bacon having exhausted his stock of twigs, a move was made to Manifold Wycke Wood, where a fresh supply was obtained. Arriving on the top of Barn Hall-hill right in the centre of the road, the twig again denoted the presence of water, this stream being traced through Manifold Wick on to the side of the hill immediately opposite, and within 150 yards of the front door of Tolleshunt Knights Rectory. From near this spot it is suggested that water could easily be carried to Salcot, where the only supply is from rainfall. Mr. Bacon, the expert, is a carpenter by trade."

In the district south-west of Colchester, around Tolleshunt D'Arcy and Tolleshunt Knights, a water supply may be obtained, either by sinking through the London clay (which forms most of the surface) to the lower Tertiary beds or the Chalk, or by means of a shallow well in the superficial gravel. A supply from the Chalk may be had only at a depth of from 300 to 400 feet. On the other hand the superficial gravel exists only in patches of variable size and thickness which here and there cap the higher ground. A glance at the Geological Survey map (48 S.W.) shows that Tolleshunt D'Arcy and Tolleshunt Major both stand upon gravel outliers of considerable size, but no deposit appears above the London clay at Tolleshunt Knights, which stands on high ground on which a capping of gravel or loam, or some mixture of the two, might be expected. Mr. W. H. Dalton, in the brief memoir describing the geology of 48 S.W. mentions Great Wigborough as an exception to the rule that gravel is to be found on the hill tops, but says nothing about Tolleshunt Knights. And though, as I have already remarked, no gravel is mapped there, I notice on the old ordnance map used by the geological surveyors the words "Wigborough Springs," between Barn Hall and Manifold Wick, about the middle of the course taken by the water seekers between Barn Hall and Tolleshunt Knights Rectory. It appears, therefore, that the diviner of to-day only recognised what had been noticed by earlier inhabitants of the district many years, perhaps centuries, ago. And it suggests the existence of a water-bearing deposit at Tolleshunt Knights, above the London clay, which has not been mapped as gravel because it consists of a variable mixture of loam and gravel or sand.

On January 4th, 1897, I visited Tolleshunt Knights, going from London to Kelvedon, the nearest railway station, and walking thence over Tiptree Heath. At Tiptree Heath the flattened contour of the ground, which is seen where the London clay is covered by boulder clay, gravel, sand or loam, is very obvious; large pits close to the road showing that the deposit in this case is gravel. A valley of no great depth

intervenes between the high ground of Tiptree Heath and that of Tolleshunt Knights. On approaching the last-named place it is seen to be a very thinly populated parish in which there are only a few scattered houses. It also becomes evident that the high ground enclosed between the roads diverging, on the one hand to Virley and Salcot, and on the other to the rectory and church of Tolleshunt Knights, has a flattened contour indicating the presence there of some surface deposit above the London clay. At Tiptree Heath, as we have seen, this surface deposit is evidently gravel, but I could see no sections in that of Tolleshunt Knights. The route taken by the diviner along the edge of the high ground between Barn Hall and the rectory is precisely that which would be taken by any field geologist wishing to know if much water came out of the surface deposit at its junction with the London clay; a previous inspection of the contours of the ground capping the plateau having shown the existence there of beds of some kind overlying the London clay.

In short, the details of those cases in which sufficient geological information is given to allow of their discussion reveal nothing in the diviner but the practical information and shrewdness in water-finding which were probably more common than they are in the days when shallow wells were freely used not only for the supply of isolated houses in the country, but throughout our largest towns. I have been unable to detect any unquestionable signs of abnormal sensitiveness to the proximity of underground water in any of the cases considered, and have noted much tending to show that a supposed feeling of that kind was really unconscious self-deception. For Lady Milbanke was evidently deceived by her sensations, and we learned from Professor Sollas' report that the diviner felt the nearness of water at one spot on an alluvial flat, and its absence a few feet away, the result showing that it was equally near in both places. And in the only other scientific experiments, those of Mr. Pease and his friends, the diviner, when blindfolded, did not feel the proximity of water at the same spots at which previously his rod had moved. Again, as we have seen, it is recorded of one diviner, that "he has been known to exhibit sensitiveness to the presence of water afterwards proved to be as much as 250 feet below the surface" ("Borderland," October, 1896, p. 429). And as the same diviner is "conscious of a feeling of *chill* when passing over water" (p. 432), his sensations must in most parts of the country receive so many violent shocks as to be utterly untrustworthy.

Yet we find Mr. Pease and his friends, in spite of the

result of their own experiments, thinking that the evidence mentioned, but not capable of being tested, showing the finding of water by diviners, demonstrates that their power "does not depend on geological or quasi-geological knowledge or instinct." But as this conclusion evidently results from the experimenters sharing the peculiar views of the diviners as to the distribution of underground water, I need only add that the necessity of discussing the subject from a geologist's point of view is thereby demonstrated. It is evident also that the nature of the distribution of underground water makes the *demonstration* of any abnormal sensitiveness to its proximity on the part of a diviner almost an impossibility. And, as a field geologist, it seems to me almost impossible to select any locality in which the question could be tested. If the discovery of water at a certain depth were equivalent as evidence to the discovery of a jar full of ancient coins, in implying the hitting or missing of a definite spot of small size, of which there was no surface indication, then there would be no need for these remarks. Special powers on the part of the diviner might then be freely conceded.

At the same time, though the available evidence seems to me to suggest no qualities on the part of the diviner beyond practical shrewdness and a good eye for indications of the presence or nearness of water in surface rocks, and of their water-bearing properties or the reverse, I am far from wishing to depreciate the value of the services he often renders. His practical merits in pointing out where water may be found at a moderate depth for the supply of isolated houses are in no way counterbalanced by unsound theories as to the way in which underground water is distributed, or by the fact that his mysterious rod can be looked upon only as a badge, equivalent to the wig or white cravat of more learned professions.

APPENDIX I.

The subject of the divining rod being evidently one likely to be discussed in "Notes and Queries," I looked through the volumes of that journal from its beginning in November, 1849, to the end of 1896, and found it mentioned at various dates, as shown below. At the end of every six years or twelve volumes, a new "series" of "Notes and Queries" begins:—

1st Series, vol. viii,	293, 350, 479, 623.	(1853.)
" " "	ix, 386.	
" " "	x, 18, 155, 449, 467.	
" " "	xi, 19, 93.	
" " "	xii, 226.	

2nd Series, vol.	i,	243.	(January—June, 1856.)
3rd	"		Nothing.
4th	"	xii,	412. (June—December, 1873.)
5th	"	i,	16.
"	"	ii,	511.
"	"	v,	507.
"	"	vi,	19, 33, 106, 150, 210, 237.
"	"	x,	295, 316, 355.
"	"	xi,	157.
6th	"	iii,	236.
"	"	vi,	325.
7th	"	viii,	186, 256.
"	"	ix,	214, 243, 338.
8th	"	iii,	107.
"	"	ix,	266, 335, 415. (January—June, 1896.)

The first mention of the divining rod in "Notes and Queries" is in the number for September 24th, 1853 (vol. viii, 293). On p. 350 of the same volume, and on pp. 623, 624, the Hutton-Milbanke experiment is alluded to, also in vol. x, pp. 18, 155, 450. The writer in vol. viii, pp. 623-24, says that Dr. Hutton disbelieved in the divining rod till "a lady of quality, who herself possessed the faculty, called upon him and gave him experimental proof. in the neighbourhood of Woolwich, that water was discoverable by that means. This Dr. Hutton afterwards publicly acknowledged." It is somewhat singular to find the interest in the divining rod shown in 1853-55, succeeded by a period of about seventeen years, 1856-1873, during which nothing on this subject appears. Since 1873 it has attracted attention from time to time as new experiments have tended to revive discussion upon it.

The "Times" of October 6th, 1882, contained an article on the divining rod, and letters thereon appeared in that journal on October 8th, 16th and 24th, 1882. The subject was discussed in the "Standard," December 25th, 28th, 29th and 31st, 1888, and January 1st, 2nd, 3rd, 4th, and 12th, 1889. Also February 24th, 1890.

The "Pall Mall Gazette" of January 25th, 1897, contains an article on the divining rod, in which the writer, after mentioning various cases, including the very recent experiment at Tolleshunt Knights, concludes with the following remarks on diviners of the present day:—

"Among those who now make use of the divining rod, hardly any two persons seem to employ the same signs for indicating the presence of water. In the hands of one 'dowser' the twig will bend upwards, in those of another downwards; while in the case of a third it will spring about in a most amazing fashion. The hazel branch is usually cut in such a way as to leave a 'fork' at one end; but while some men will hold the prongs of the fork against the balls of their thumbs and third fingers, others will slip one prong under the little finger and let the rest

of the stick balance on the back of the hand. Any movement of the stick, apart from that necessitated by its being carried from place to place, is supposed to be due to the presence of water and without volition on the part of the diviner. In some instances the 'dowser' has professed to be unable to carry out his experiments satisfactorily unless absolute silence was preserved by those about him, while one old diviner invariably refused to pursue his investigations where it was possible for any one to observe him. In this latter case the art of divination must have been considerably simplified. Divining experts have also differed as to the hour best suited for their tests, some preferring early morn, others midday, and yet others the dead of night.

"In 1893 there died, in a remote North Norfolk hamlet, an old woodman who was looked upon as an exceptionally skilled manipulator of the divining rod. During his latter years he lived in a small lath-and-plaster walled cottage on the outskirts of a scanty coppice, from which he was accustomed to cut his hazel twigs. Until he became too old and feeble to move far from his home, he would frequently make long journeys into distant counties for the purpose of seeking hidden springs of water. It always pleased him to pose as a somewhat mysterious character, and when he thought he was observed he would come to a standstill on the public road and go through all kinds of queer antics to the amazement—and often to the amusement—of his beholders. He lived quite alone, and it was only when seized with his final illness that he would permit any one to pass the threshold of his cottage, though there was no obvious reason why he should have been so particular in this respect. Questioned once as to his supposed skill with the rod, he professed himself quite unable to understand it; but he maintained that there was no deception in any of the experiments he had conducted, and that, with one exception, they had proved successful. The finding of water, he said, 'came natural' to him, and, providing he had his hazel stick with him, he could tell whenever he was in the neighbourhood of a spring as he walked along the road."

In the "Pall Mall Gazette" of February 13th appeared the following article:—

"The Divining Rod. By Lady Dorothy Nevill.

"Some few days ago I saw in the 'Pall Mall Gazette' an article somewhat doubting the efficacy of the divining rod for finding water. I think I am in a position to prove its efficaciousness. In one of the many lovely portions of Sussex, between Tunbridge Wells and Eastbourne, there is a most beautiful old house, at Mayfield, once the palace of Sir Thomas Gresham, where he was knighted by the Virgin Queen, and where St. Dunstan, as Archbishop of Canterbury, often came, and where are still preserved the veritable tongs with which the said St. Dunstan assaulted the devil's nose when he came to offer him many evil things. It is now the Convent of the Holy Child, and as such commands respect and reverence everywhere. As in most parts of Sussex, water is wanting, and the lady superior bethought herself of calling in the aid of an expert to try and solve the difficulty. They sent for a gentleman from the North, who had discovered that he possessed the faculty of divining where water was to be found. He was invited to explore the grounds of the old palace, and he went with one of the nuns over the neighbouring meadows and pointed out several places where water would be found and the direction where the underground spring flowed. He used no divining rod, but simply walked over the ground, and when asked what he experi-

enced to cause him to say that there was water below, he said he could not explain exactly what he felt, but that it was something like a cramp in his back, that the sensation was a painful one, and that it made him ill if he continued the process for any length of time. He also said he could not tell whether the water was near the surface or below; he had not had sufficient experience to detect the difference. The authorities of Mayfield were not sufficiently convinced to begin operations, but were so far impressed as to determine to call in the aid of another expert. He came, and strangely enough to those who doubt the faculty, he selected the same spots and pointed out the direction of the flowing water the same as the gentleman had previously done. The expert went into a species of convulsion, shook and trembled at the spot he considered to be over the water, and he was of opinion that the stronger the convulsion the greater the quantity of water below. He used the spring of a watch as his divining rod. I don't know if he considered this a necessity. Having decided to bore for water at a point indicated, and where the expert considered the water to be near the surface, they found it at a depth of 30 feet, but for several reasons the spot was afterwards abandoned for one nearer the house, which both amateur and expert considered a favourable position. Here again water was found some 30 feet below the surface, but as the borers thought the supply insufficient, they again bored to a depth of 270 feet, the result being an inexhaustible supply. The whole of last summer was very dry in the neighbourhood, and yet the water showed no sign of falling off (though nearly all the wells had given out), but gave a constant supply, as if unaffected by the state of affairs at the surface. I must remark that, when I went last year to see my friends of the convent at Mayfield, I found them in great consternation, as all this water was found to be chalybeate, with much iron, which rendered it useless for washing purposes."

Mayfield geologically is in the middle of the district occupied by the "Hastings Beds," which form the undulating ground between Tonbridge and Hastings, and have a total thickness of about 1,000 feet. They have been grouped into four or five sub-divisions having names such as "Tunbridge Wells Sand," "Wadhurst Clay," etc., which imply that considerable thicknesses of strata, mainly sand and sandstone, alternate with others mainly clayey. The village of Mayfield stands on Tunbridge Wells Sand, and the account in the "Pall Mall Gazette" suggests to me that the borers got water at two different spots at 30 feet owing to the presence locally of a clayey seam just below that depth, which prevented the water falling through the sandstone from sinking lower. Naturally a more copious supply, unaffected by droughts, was obtainable from the lower beds of the sandy formation at a depth of 270 feet. But Mayfield probably owes its existence as a village to the presence of the Tunbridge Wells Sand there and the possibility of getting a water supply from the shallow wells. Topley, in his "Geological Survey Memoir,"¹ p. 396, remarks:—"On the Hastings Beds in Kent and Sussex there are ninety-

¹ "Geology of the Weald."

seven, towns and villages, seventy-nine of which have sandy sites.' Of course, in some cases, the proximity of a stream has furnished a clayey site with a water supply. And here, as elsewhere, isolated farm houses existed, and now exist dependent simply on ponds and rain-water butts. But in the district occupied by the Hastings Beds neither sandy nor clayey formations predominate to any perceptible degree as regards the amount of surface occupied by each of them, while it would be difficult to select a site of either kind lying more than two miles away from an area covered by the other kind of rock. This makes the selection of water-bearing sandy sites the more significant.

In the "Pall Mall Gazette" of February 17th (1897), appeared a brief rejoinder to Lady Dorothy Nevill from the writer of the article on the divining rod of January 25th. And in the same journal, on February 20th, the following case is given:—

"The Divining Rod."

"To the Editor of the 'Pall Mall Gazette.'

"Sir,—I venture to trouble you with a short account of my own experience of water-finders and their methods. We are situated in Needwood Forest, on the top of a mass of marl thrust up between the rivers Dove and Trent. Our water is derived from wells averaging from 140 feet to 180 feet deep, and owing to a series of dry years our supply has recently been very scanty.

"Our best well gives about 4,000 gallons in the twenty-four hours. About three months ago I sent for Mr. Mullins, the well-known water-finder, who walked round the property with a small hazel wand or twig in his hands. Every now and then the wand seemed to twitch, and he indicated that water would be found in these places, naming an approximate depth and probable supply. At last we came to a field where the twig gave indications of a row of springs, and Mullins informed us that if we sank we should probably get a supply of nearly 40,000 gallons in the twenty-four hours. We have sunk, and at 140 feet to 150 feet we have a most abundant supply, quite equal to what was promised, and we expect to get more by driving adits right and left.

"One curious thing was that when the twig was placed in another person's hands turning towards the ground, on Mullins grasping the hands the twig slowly turned up; but this happened only with two out of four persons experimented on. I cannot explain the phenomenon, but it appears to me to be perfectly genuine, and certainly in my case the result has been very successful.—I am, faithfully yours,

"BURTON.

"February 18."

In this case we learn that the existing supply was derived from wells averaging from 140 feet to 180 feet in depth, and that on sinking at another spot on the same property water was found at a depth of 140 feet to 150 feet. The natural inferences seem to be that the diviner, knowing the existing wells and their

depth, saw that water would, in all probability, be obtainable at a similar distance from the surface a few hundred yards away. And had local scarcity of joints and fissures resulted in a scanty supply, more would have been obtained by the well-known expedient of "driving adits right and left," and a good supply secured at that depth, after all.

In the "*Athenæum*" of February 13th, 1897, there is a review of "*The Sacred Tree*" by Mrs. J. H. Philpot (Macmillan & Co.). Mrs. Philpot is quoted by the reviewer as stating that she thinks the divining rod "a superstition cognate to the belief in sacred trees," and as remarking that, "it is not necessary to discuss the credibility of their [the diviner's] assertions, or to formulate a theory to account for their success." The reviewer differs from Mrs. Philpot on both points, holding both that the divining rod has no connection with tree-worship, and that the apparent success of the diviner in so many cases makes the ascertainment of its causes desirable. He seems, however, to think Lady N. (of the "*Quarterly Review*" case) and Lady Milbanke were two distinct persons, remarking:—"A Lady Noel is quoted as a successful amateur dowser. . . . Lady Milbanke, Byron's wife's mother, also 'dowsed.' Dr. Hutton tested Lady Noel with success."

There is an article on "*The Divining Rod*" in "*Pearson's Magazine*" for March, 1897, pp. 302-312. The writer inclines to the belief that "the diviner transmits movement to the rod, such movement being the outcome of involuntary nerve-muscular contractions which are caused in some persons by the near presence of running water." Portraits of diviners and views showing the scenes of their experiments are given, but the small scale of the latter makes comment on them somewhat difficult. However, in the case at Pembrey, on the South Wales Coalfield, "the face of the hill" looks to me like the dip-slope of a sandstone. The rain falling on this rock would flow downward in the direction of the dip, and (as coal-measure sandstones are seldom of any great thickness) a supply of water at no great depth might naturally be expected in it anywhere at a certain distance from the top of the slope. And the well appears to be a considerable distance from the top. In the case at The Hendre, Monmouth, the diviner appears to be searching for water on an alluvial flat. But in this instance—if my supposition is correct as to the site—water would naturally be found at the same level everywhere (as in the experiment noted by Professor Sollas) and one spot was as good as another for the water-seekers.

An anecdote is given of an experiment at Osterley Park, where a party of scientific men were invited to witness the

proceedings of a well-known diviner. The latter "indicated a place or places where water would," he said, "be found, and as he walked across the land stakes were stuck in the earth to mark the track of the hidden water." Then one of the scientific visitors said to the diviner:—"We will blindfold you, and you shall start again, and we will see if you again take the direction indicated by the stakes in the ground." The diviner, however, decidedly refused, saying:—"I didn't come here to be blindfolded, I came here to find water for Lord Jersey," and adding, "I do this to earn my living, and if I chanced to fail the second time and not keep to the line of stakes, what would become of my reputation, now valuable, with all you scientific gentlemen as witnesses to my failure?"

In the cases in which Mr. Pease and his friends experimented with diviners, different results were given when the diviners were blindfolded and when they were not. In that just mentioned, the diviner refused lest he should fail. But on the hypothesis that he is guided by peculiar physical sensations resulting from the nearness of underground water, and not by observation of external objects, blindfolding ought to be advantageous. For he would then become more nearly the passive instrument and indicator of his inner feelings.

The novel by Lucas Cleeve styled "*The Water-finder*," published in February, 1897, has a diviner for its hero. In Chapter XIII, there is some account of the mysterious "faculty for water-finding," and, among other details, the statement that "there were proofs of the gift in Judith Noel, afterwards Lady Milbanke."

I will only add, in conclusion, that the following advertisement appeared in the "*Times*," of March 22nd, 1897:—

"Water Discovered by the Divining Rod.—Results guaranteed; 30 years' experience.—Merryweather, 63, Long-acre, London, W.C."

"*Times*," March 22, 1897.

APPENDIX II.

Divining at Ampthill, Bedfordshire.

In the "*Times*" and "*Daily News*" of June 1st, 1897, and in other newspapers of the same date, appeared paragraphs stating that the fees of a water-diviner who had been called in by the Ampthill Urban District Council had been disallowed by the Local Government Auditor for the county. Below is the "*Times*" report:—

"A Water Diviner's Fees."

"At the annual audit of the accounts of the Urban District Council of Ampthill, Bedfordshire, which was completed on Friday last by Mr.

W. A. Casson, the Local Government auditor for the county, several ratepayers raised objections to an expenditure incurred in the employment of Mr. Leicester Gataker, a water diviner. They produced geological plans and sections to show that, if the diviner's recommendations were acted on, the council would be boring into a stratum of Oxford clay, the depth of which had not been fathomed as yet, although a boring had been made to 700 feet, and no water obtained. The district council had applied to the Local Government Board for a loan to carry out boring experiments to test Gataker's recommendations. The Board ordered a water supply to be procured within a limited time, leaving the council a free hand how they went to work, and they unanimously resolved to employ Gataker. In reply to the auditor, the chairman said that Gataker did undoubtedly hold out that he had a mysterious power of discovering water. His method was to start with his arms spread out and walk slowly over the ground. Suddenly he would stop as though he felt a shock, and it was there that he 'located' a spring. He would then step backwards and forwards to ascertain the depth of the spring and the volume of water. In his report he named a number of springs in one field, and the total of the water there was more than ample for the town. The auditor, in announcing his decision, stated that in seeking for water the district council had disregarded the reports of experts and had gone for guidance to a man who had a reputation for discovering water by some unusual and peculiar method not possible to ordinary persons, and the question he had to settle was whether this was legal or not. He noted that Gataker took the trouble to do what ordinary professional men would not think of doing—namely, to state, 'I guarantee my business to be genuine,' whilst no guarantee whatever in the legal sense was given that water would be found where it was located. Money might properly be spent on experimental borings under proper advice, but it had not been proved that this man had any greater power than any one else. The district council were in the position of trustees of public moneys, and must not spend them in a speculative manner. In the only case that had come before the Courts which bore upon this matter the judges had held that 'the pretence of power, whether moral, physical, or supernatural, with intent to obtain money was sufficient to constitute an offence within the meaning of the law,' and he (the auditor) thought that, as Gataker claimed to exercise some such power, his employment was clearly illegal, and the amount of his fee would, therefore, be disallowed, and the gentlemen who authorized the payment surcharged with it. They could appeal either to the Queen's Bench Division or to the Local Government Board against the surcharge."

Mr. A. C. G. Cameron, of the Geological Survey, having been good enough to send me much information about this case, in answer to my request for it, I learn from Bedfordshire newspaper cuttings that some time ago the water of the Ampthill wells was found unfit for drinking, the medical officer stating that the supply from all the wells in the town was bad. It was accordingly decided that a better supply should be obtained. But in January, 1897, the Local Government Board forwarded to the Ampthill Urban District Council a copy of a complaint made by Dr. H. F. Holland and five other residents at Ampthill, on account of the Ampthill Council's delay in providing it. The complainants stated that the late Local Board, in December, 1894,

"Accepted Mr. Beesley's offer to obtain a report respecting a water supply for Ampthill from Mr. A. C. G. Cameron, of Bedford, Her Majesty's Geological Surveyor, and in January, 1895, Mr. Beesley submitted a report thereon, with one from Mr. Cameron, to the Urban District Council. Therefore we now consider the council is not acting in the best interests of the inhabitants in disregarding the order of Her Majesty's Geological Surveyor for that of a water diviner, etc."

In answer to this communication a reply was drawn up by the clerk to the Ampthill Council, in which it is stated:—

"With regard to the water supply, as stated by Dr. Holland and his friends, Mr. Cameron, the Geological Surveyor of Bedford, made his report upon the probabilities of finding water in the district, but owing to a doubt of the sufficiency of the supply at two localities which he pointed out without robbing the surrounding occupiers, his plans were not adopted, and in the mean time, as you were informed, the water expert, Mr. Gataker, was engaged to try for water.

"The clerk adds that Dr. Holland had always endeavoured to force upon this council the adoption of Mr. Beesley's expensive scheme (which would most probably be opposed in Parliament) of obtaining water from Barton, eight or nine miles distant."

Mr. Cameron says that Barton is but from seven to eight miles away. However it is evident that the diviner was called in on account of the expense of the geologist's plan.

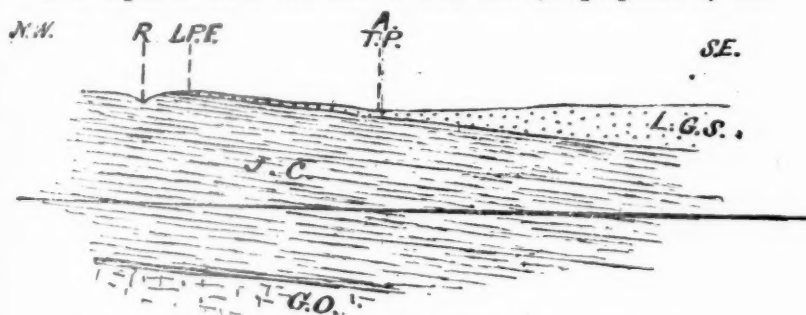
Mr. Gataker, the diviner, on his first inspection of the district, stated that sinkings of from 25 to 100 feet in Little Park field would yield more than the quantity of water required for the town. But the quantity obtained being insignificant, he, some months later, advised deeper sinkings at the same spot, called elsewhere Mr. Fountain's field, on the Little Park Estate. In the "*Bedfordshire Mercury*," April 24th, 1897, Mr. Gataker remarks:—

"On April 2, I paid a second visit to Ampthill, as requested by the District Council, for the purpose of re-locating the sites indicated by me on the 13th of August last in the Little Park field, at which a supply of water can be obtained to supply the district. As the spots were located irregularly last time, I took the opportunity this visit to locate them in one line as near as possible."

Mr. Gataker then gives details as to the supply available, estimating that a minimum supply of 35,000 to 40,000 gallons a day can be found in that field, obtainable from ten springs varying in depth from 150 to 300 feet. To this report was appended a note in which it is stated that, in addition to the quantity of water obtainable at greater depths, Mr. Gataker predicts "that about 15,000 gallons will be found in the top sand." He therefore thinks that there is sufficient water in Ampthill parish without the expense of going to another.

Amphthill is situated on sand belonging to the formation known as the Lower Greensand, near its junction with the underlying Jurassic Clay. This clay is many hundreds of feet thick, and consists of the Oxford and Kimeridge Clays, which form one mass, owing to the local absence of the Calcareous Grit usually found separating them. Borings to a depth of 700 feet are said to have been made in this clay in former years, the bottom of the clay not having been reached and no water obtained.

Mr. Cameron tells me that the maximum thickness of the sand at Little Park field is only from 10 to 20 feet, and that there are spots there at which the underlying Jurassic clay appears. He thinks that the 700 feet given as the thickness of that clay may perhaps be too great. But if we suppose it to be only 500 or 600 feet it is evident that sinkings into the clay to a depth of from 150 feet to 300 feet (as proposed by Mr.



G.O. = Great Oolite. *J.C.* = Jurassic Clays. *L.G.S.* = Lower Greensand.
R. = Railway. *L.P.F.* = Little Park Field. *A.T.P.* = Amphthill Town Pump.

Gataker) must be useless, as all the water found in them would be derived from the sand above. This is, in short, a case in which knowledge of geological structure, and not a keen eye for surface water-bearing beds, is required. Mr. Cameron kindly sent me a section explaining his view, from which I take as much as will illustrate the geology of Amphthill.

Before leaving this case it seems worth while to call attention to a letter addressed to the Editor of the "Beds Times," by "Henry Chesterman, Champion Expert Water-finder." It appears in the "Beds Times" of June 19th, 1897. In it he says, *inter alia*:—

"I strongly recommend your Council to engage a water-finder with more experience and to verify the spots marked by your water-finder who as not been without bad shotes, on less the water-finder will guarantee the amount of water and the depth within 20 feet and if he fail on this to have no money for the boring or sinking done, this is how I do the Parish

Council work which prevents bad feeling if there is not any water, I don't know if your water-finder pretended to find the water with his *hands* spread out without a rod or not, if so I am not surprised at the ratepayers feeling their selves disturbed as there is no such thing as finding water that way with hand and fingers stretched out on less to ketch the rain falling and such practice is a disgrace to the rod."

Thus this Ampthill case is of interest in showing the very varying amount of importance attached to ritual by individual diviners.

APPENDIX III.

Conclusion.

Mr. A. C. G. Cameron having informed me that he believed Mr. R. H. Tiddeman, of the Geological Survey, knew of some divining cases, I wrote to Mr. Tiddeman, who is at present stationed in Glamorganshire, and who kindly gave me the following particulars of a few that he had known something about near Bridgend in that county.

(1) At Porthcawl a diviner named Thompkins was called in by the local council. Mr. Tiddeman tells me that the diviner took them to a little flat in Triassic conglomerate lying just below a small escarpment, caused by the presence there of some more conglomerate lying above red marl. This little flat is not quite 50 feet above the level of the sea. According to the diviner's instructions, a shaft was sunk there in this conglomerate to a depth of 140 feet. At a depth of 32 feet a supply of water was obtained amounting to 700 gallons per hour, but that being insufficient they deepened the shaft to 140 feet without meeting with any additional water except close to the bottom, where a little trickled in.

(2) A diviner was employed near Pyle by a publican named Loveluck. He promised water at a depth of 12 feet at a spot below a little escarpment in Triassic marls, but no water was found.

(3) A lady amateur-diviner recommended Lord Dunraven to sink on the top of the hill near Dunraven Castle, without result. Mr. Tiddeman says that the rock in this case was Lias limestone.

In addition, Mr. Tiddeman gives me the following details of a Yorkshire case.

(4) Above Whitewell, in the valley of the Hodder near Clitheroe, where the rocks are Carboniferous limestone and shale, covered here and there by Boulder Clay, a diviner named Mullins was called in to get water for a farm. He carried his rod across the buried pipe which conveys the

main water supply for Preston, without noticing it, and recommended sinking in a corner where rushes were growing. His advice, however, was not acted upon. Mr. Tiddeman adds that having written to the "*Preston Herald*" about this case, Mullins rejoined that "he had never been near Preston water-works, to his knowledge," which was evidently true.

Professor W. F. Barrett has written a most important paper on Water-Divining, which will appear in the XXXIInd part of the "*Proceedings of the Society for Psychical Research*." As he has been good enough to send me his proof sheets and invite comment upon them, I have made remarks on various cases in which I could obtain sufficient knowledge of the local geology to enable me to do so usefully. These remarks will appear with his paper. I will only add that while every anthropologist must be glad that the subject has been taken up by a physicist so eminent as Professor Barrett, it appears to me that it should also be surveyed from the point of view of the field-geologist. For he only is likely to form a just estimate of the great amount of practical knowledge obtainable by the eye trained to notice the surface features of the ground, even in a district not previously known to the observer.

As to the nature of the personal peculiarities of those in whose hands the rod turns violently, I will only add that they probably resemble in nervous organisation those who become intensely excited at fervid religious meetings. The amateur-diviner appears to be influenced solely by his inner sensations; the professional by his inner sensations together with his practical knowledge of water-bearing surface beds. Both unite in the erroneous belief that underground water exists (in water-bearing beds) concentrated at certain spots and absent a few feet away. Consequently the facts as to the distribution of underground water seem to be fatal to the notions that the diviner's sensations, whatever their origin, are caused by the peculiar nearness of water at the points where they are specially felt, or that he possesses any peculiar or abnormal faculty for its discovery.

NOTES on a BOX used in SMUGGLING on the SCOTTISH BORDER
between FIFTY and SIXTY YEARS ago. By T. V. HOLMES.

THIS box is one which was actually used, about the year 1842, for smuggling whiskey from Scotland into Cumberland. It is nearly cubical in form, being about $9\frac{1}{4}$ inches long by $7\frac{1}{4}$ inches broad and $7\frac{1}{4}$ inches deep, measured externally. The lid is fastened down by four screws, one at each corner, and it would therefore take some little time to open. Inside is a small keg, capable of holding half a gallon of whiskey; the space inside the box not occupied by the keg was filled (when in use) with small pebbles. When seized and shaken by the exciseman only the rattling of pebbles would be heard, and the owner of the box would almost certainly be considered a mere harmless collector of stones; and the time involved in opening the box would in itself tend to be a strong check on further investigation.

The box was given to me in 1889 by an old friend, an aged and respected citizen of Carlisle, who had used it himself, as an amateur, in his youth. This smuggling of whiskey from the Scottish to the English side of the Border was caused by the exaction of a much greater amount of excise duty on the English than on the Scottish side, English borderers naturally resenting this absurd anomaly. Salt was similarly treated till the year 1822, when a man named Harding, of Great Corby, Cumberland, was shot by an exciseman named Forster while endeavouring to smuggle three stones of salt in order to cure his pig, an incident which may have had some influence in causing a great reduction of the salt duty in 1823. In spite, however, of a desperate affray which, my friend informed me, took place on Eden Bridge (Carlisle) between smugglers and excisemen in 1824, the equalisation, on both sides of the Border, of the excise duty on whiskey did not occur until 1855.

As the former existence of Border smuggling is now singularly little known, I will here give two incidents connected with it which were told me by my friend Mr. R. O. Heslop, of Newcastle-on-Tyne,¹ as related to him by relatives of his own. Carlisle is only between eight and nine miles from the nearest point on the Scottish Border, and the river Eden, or the Solway, into which it flows, must be crossed by any person entering the city from the north. A beggar-woman, singing a melancholy song, and carrying a heavy baby under her shawl, slowly worked

¹ Author of "Northumberland Words," Eng. Dialect Soc., 1894.

her way across Eden Bridge. The baby was constructed of tin, and held as much whiskey as the strength of the bearer permitted. But one of the latest feats known to Mr. Heslop occurred on the eastern border after the Newcastle and Berwick railway had been opened through to Edinburgh (1847-50). The favourite annual factory trip was then from Newcastle to Edinburgh. A special train was run, and the trippers were accompanied by the factory bands, and took with them many banners, which were carried on painted poles with the usual wooden button on the top; but the poles were iron tubes made to look like wood. The button on the top unscrewed, and the poles were filled with whiskey in Edinburgh and borne in triumph through the streets to the railway station. There the flags were wrapped up, and the poles laid upon the top of the carriages outside. The revenue officers boarded the train at Berwick and searched everything but the poles on the roof.

But in the case of Border smuggling the most remarkable thing is not the ingenuity of the smugglers, but the almost incredible conduct of the successive Administrations, which, differing more or less in other matters, agreed in perpetuating this monstrous system for the promotion of smuggling within the limits of the same kingdom. Sir Walter Scott remarks in "*Redgauntlet*" (Chap. XIII) that Alan Fairford had long known that "the excise laws had occasioned an active contraband trade between Scotland and England, which then [about 1764] as now, [1824] existed, and will continue to exist, until the utter abolition of the wretched system which establishes an inequality of duties between the different parts of the same kingdom; a system, be it said in passing, mightily resembling the conduct of the pugilist, who should tie up one arm that he might fight the better with the other." But though "*Redgauntlet*" must have been more generally read, in 1824, than any other novel of that year, more than a quarter of a century was to elapse before this gross and gratuitous evil was abolished. Lockhart remarks that more of Scott's personal experiences are given in "*Redgauntlet*" than in any other of the Waverley Novels. But for this fortunate circumstance we should now be without any picture of Border smuggling, though tales of organised smuggling with foreign countries on our southern shores are by no means rare.

On consulting Hansard, I find that in July, 1851, the then Chancellor of the Exchequer stated that English spirits paid 7s. 10d. a gallon duty, Scottish spirits 3s. 8d., and Irish spirits only 2s. 8d. In 1853 Mr. Gladstone, then Chancellor of the Exchequer, made a step towards equalisation by

raising the duty on Scottish spirits to 4s. 8d., and that on Irish spirits to 3s. 4d. In 1854 the duty on Scottish spirits became 5s. 8d., and on Irish 4s. And in 1855, during the Crimean War, the duty on English and Scottish spirits was equalised, both paying 7s. 10d. a gallon, while that on Irish spirits was raised to 6s.

JUNE 8TH, 1897.

E. W. BRABROOK, Esq., F.S.A., *President, in the Chair.*

The Minutes of the last Meeting were read and signed.

Mr. H. W. SETON-KARR read a paper on "Newly Discovered Stone Implements from Somaliland, and from the Lost Flint Mines of Egypt."

Dr. GARSON gave an abstract of a paper by Dr. PAUL TOPINARD, on "Anthropology in Brittany," and Dr. JOHN BEDDOE read a paper by himself and Mr. A. W. MOORE on "Physical Anthropology of the Isle of Man."

Votes of thanks were passed for the papers.

Locality whence collected and tribe when known.	Anatomical Museum, Cambridge.							Vesali- anum, Basle.	British Museum.	
	Transvaal tribe.	Transvaal tribe from Cradock.	Strandloupers from Port Elizabeth.			Cape, exact origin unknown.		Transvaal.	Kalahari desert.	
			1742	1743	1744	{ 24 7	23 —		94, 4, 25, 1	94, 4, 25, 2
Catalogue number	1751	1738	1742	1743	1744	{ 24 7	23 —	M13	{ 94, 4, 25, 1	{ 94, 4, 25, 2
Sex	m	f	f	f	m	f	m	m	m	f
Cranial capacity in c.c. . . .	—	1390	1515	1185	1355	1060	1065	1405	1220	—
Maximum length	187	187	182	169	182	162	164	182	177	185
Maximum breadth	133	139	143	135	137	126	126	140	138	135
Basi-bregmatic height	130	132	126	123	129	121	121	134	126	133·5
Minimum frontal breadth	95	98	96	91	98·5	94	92	96	97	99
Maximum frontal breadth	115	118	119	111	112	112	108·5	—	107	118
Bi-stephanic breadth	106	118	119	111	107	109	108·5	—	105	113
Pterion breadth	109	106	99	99	107	100	99	—	104·5	110
Asterion breadth	106	108	105	106·5	108	101	100	—	106·5	110
Basi-nasal length	105	95	95	90	95	91	98	67	97·5	102
Basi-alveolar length	111	99	91	92	98	93	108	61	98	96
Foramen magnum length	37	39	41	37·5	39	36·5	33	—	41	38·5
Foramen magnum breadth	29·5	29	28	29	28	33	29	—	31	28
External bi-orbital breadth	108	110	100	103	110·5	101	102	—	109	106·5
Internal bi-orbital breadth	98	103	93	95	101	94	95	—	102	99
Bi-jugal breadth	124	117	108	105	114	105	106	—	122	115
Bi-malar breadth	120	119	105	103	119	103	103	—	125	111
Bi-maxillary breadth	108	97	81·5	84	98	82	84	95	91	93
Bi-zygomatic breadth	—	127	116	120	124	116	120	122	136·5	—
Ophryo-alveolar height	96	84	74	83	94	81	85	—	91	87·5
Naso-alveolar height	70	66	52	56	65	59	65	—	60	65
Spino-alveolar height	21	20	14·5	14	21·5	18	21	—	16	23
Ophryo-mental height	147	126	—	125	—	121	126	—	—	—
Naso-mental height	122	107	—	97·5	—	100	106	—	—	—
Height of the cheek-bones	25·5	20·5	20	21	22	16	17	—	21	15
Orbital breadth	39	40·5	36	37	38	37	39	{ R38 L43 }	40	39
Orbital height	33	33	27·5	29	31	33	{ R36 L37 }	28	32·5	36
Bi-daeryc breadth	21	21	18	20	23	20	19	—	23	22
Nasal height	49	47	38	43	44	41	45	41	45	41
Nasal breadth	29·5	31	25	23	26·5	23	24	27	27	25
External palatine length	64	60	47·5	51	52	53	61	—	55	50
Internal palatine length	58	57	41	46	45	—	54	—	50	46
External palatine breadth	71	62	54	53	58	57·5	56	—	62	61
Internal palatine breadth	38	37	—	35	34	33	31	—	35	36
Anterior palatine breadth	44	39	—	39	39	36	39	—	45	44
Dental length	46	—	—	—	38	—	45	—	—	41
Curves { naso-malar	105	110	99	100·5	108	102·5	105	—	110	104
sub-cerebral	29	19	21·5	28	30	21·5	20	—	28	21
total frontal	121	125	131·5	127	133	112	112	—	122	127
parietal	126	135	127	117	132	120	117	—	108	128
supra-occipital	58	—	—	—	—	51	49	—	70	65
total occipital	106	122	102	105	106	94	100	—	112	116
total sagittal	353	382	360	349	371	326	329	—	342	371
supra-auricular	290	297	304	281	301	270	279	—	285	296
total transverse	433	445	427	416	415	388	408	—	423	440
pre-auricular	231	234	230	219	225	217	223	—	231	220
total horizontal	514	530	521	485	511	462	466	—	500	519
INDICES.										
Length-breadth	71·1	74·4	78·6	79·9	75·3	77·8	76·8	76·9	78	78·4
Length-height	69·5	70·6	69·2	72·8	70·9	74·7	73·8	73·6	71·2	72·2
Breadth-height	97·7	94·9	88·1	91·1	94·2	96	96	95·7	91·3	98·9
Upper facial (Kollmann)	—	52	44·8	46·7	52·5	50·9	54·2	46·7	44	—
Upper facial (Broca)	—	66·1	63·8	69·2	75·9	69·8	70·8	—	66·7	—
Total facial (Kollmann)	—	84·3	—	81·2	—	86·2	88·3	82	—	—
Total facial (Broca)	—	99·2	—	104·2	—	104·3	105	—	—	—
Maxillary facial (Virchow)	64·8	68	63·8	66·7	66·5	72	77·4	60	65·9	69·9
Orbital	84·6	81·5	76·4	78·4	81·6	89·2	{ R92·3 L94·9 }	{ R73·6 L65·1 }	81·3	92·3
Nasal	60·2	66	65·8	53·5	60·2	56·1	53·3	65·8	60	61
Palatal (staphylinic)	65·5	64·9	—	76·1	75·6	70·2	57·4	88·9	70	78·3
Palatal (uranic)	110·9	103·3	113·7	103·9	111·3	107·5	91·8	—	112·7	122
Alveolar	105·7	104·2	95·8	102·2	103·2	102·2	110·2	91	100·5	94·1
Dental	43·8	—	—	—	40	44	45·2	—	—	40·2
Fronto-zygomatic	—	92·9	102·6	92·5	90·3	96·6	90·4	—	71·1	—
Naso-malar	107·1	106·8	106·4	105·8	106·9	109	110·3	—	107·9	105·1
Relation minimum frontal breadth-maximum breadth	71·5	70·4	67·1	67·4	71·2	74·6	73	—	70·3	73·3
Relation bi-stephanic breadth-maximum breadth	79·7	82·7	83·9	80·7	78·1	86·5	86·1	—	76·1	83·7
pterion breadth-maximum breadth	82	76·2	69·2	73·3	78·1	79·4	78·6	—	75·7	81·5
asterion breadth-maximum breadth	79·7	77·6	73·4	78·9	78·8	80·2	79·4	—	77·2	81·5
sub-cerebral-total frontal curve	24	15·2	16·3	22	22·6	19·2	17·9	—	23	16·5
frontal-total sagittal curve	34·3	32·7	36·5	36·4	35·8	34·4	34	—	35·7	34·2
parietal-total sagittal curve	35·7	35·3	35·3	33·5	35·6	36·8	35·6	—	31·6	34·5
occipital-total sagittal curve	30	31·9	28·3	30·1	28·6	28·8	30·4	—	32·7	31·3
supra-auricular-total transverse curve	67	66·7	71·2	67·5	72·5	69·6	68·9	—	67·4	67·3
pre-auricular-total horizontal curve	44·9	44·2	44·1	43·5	44	46·9	47·9	—	46·2	42·4

TABLE OF MEASUREMENTS OF ADULT SKULLS IN MILLIME

BUSHMEN.

Museum of the Royal College of Surgeons.

Museum of the Royal College of Surgeons.																	
	Capetown.			Earthman from Orange River Settlement.	Cape Colony.												
	1301	1300	1302	1303	1303B	1303C	1303D	1303E	1303G	1304	1305	1624	1625	1626	1628	1623	
f	f	m	f	m	f	m	f	m	m	f	f	m	f	f	f	f	
—	1250	1260	1170	1400	1110	—	1235	1280	1505	1360	1075	1292	1400	1190	1190	1410	—
185	170	173	169	184	170	181	177	172	189	179	170	184	172	173	173	179	18
135	133	134	130	140	134	137	131	137	139	137	132	126	125	135	130	137	13
133·5	124	128	125	134	123	127	120	125	126	125	119	123	124	121	127	126	13
99	95	86	93	101	93	94	88	95	98	93·5	88	91	93	92	86	96	8
118	111	111	113	121	113	119	108	116	117	110	106	106	107	110	105	118	10
113	107	111	113	115	111	110	105	115	116	108	105	106	107	110	—	118	10
110	97	104	107·5	112	99	107	102	105	111	106	93	95	95	100	98	107	10
110	104	109	103	112	101	101	105	101	108	105	108	104	100	112	105	95	10
102	91	91	90	103	98	93	94	90	93	92	—	94	89	85	88	98	10
96	90	—	87	—	93	100	96	92	91	90	—	98	87	87	87	99	10
38·5	—	35	35	35	31	34	36	36	36·5	37	36	36·5	33	36	35	34	3
28	24	27	30	31	30	30	29	28	30	29	30	30	28	28	29	25	2
106·5	101	104	101	109	103	105	98	105	102	98	—	103	105	95	99	105	10
99	95	94	96	101	96	98	92	95	95	88	—	101	97·5	84	93	97	9
15	101·5	112	101	117	106·5	114	106	108	107	107	—	114	109	99	105	112	11
11	101	110	100	113	105	112	102	104	100	100	—	113	106	98	97	108	10
93	86·5	92·5	97·5	97	86	99	90	84	85	95	—	104	90	82	88	91	9
—	112	120	111	133	116	118	115	117	119	118	—	125	117	108	115	123	12
87·5	84	—	82	85	80	89	85	83	77	82	—	96	81	78	—	78	9
65	61	—	62	59	62	68	64	59	53	59	—	66	60	55	56	59	6
23	17	—	18	—	19	22	22	22	18	17	—	22	21	16	15	17	2
—	124	—	118	—	118	—	—	126	—	119	—	—	118	—	—	118	—
—	101	—	97·5	—	101	—	—	102	—	97	—	—	94	—	—	98	—
15	21	21	18 {	R26 L22 }	19	22	19	23	16	23·5	—	24	20	21	18	18	2
39	37	38	38	40	36	39	35	37	37	34	—	37	38	33	34	39	3
36	32	29	31	30	30	31	33	28	32	30	—	31	31	30	29	33 {	R3 L3
22	21	23	22	22	25	26	24	22	22	22	—	24	22	20	23	20	2
41	44	46	44	48	45	48	44	43	35	43	—	45	39	40	43	42	4
25	24	29	27	29	24	25	24	25	26	25	—	28	27	22	24	25	2
50	44	—	48	—	48	55	52	50	46	50	—	53	47·5	44·5	—	52	6
46	41	—	44	45	44	51	48	46	42	47	—	47	40	38	—	46	5
61	56	—	60	—	55	70	56	53	82	60	—	66	53	55	—	—	6
36	33	—	34	36	33	39	31	32	35	34	—	45	26	30	—	40	3
44	35	—	40	—	34	38·5	37	38	44	41	—	45	34	38	—	40	4
41	39	—	41	—	39·5	—	43	43	—	—	—	43	—	—	—	—	—
04	101	99	101	107	104	103	98	100	102	98	—	102	105	90	—	104	14
21	24	24	—	25	18	21	21	24	22	22	22	29	20	23	—	19	2
27	121	130	—	142	114	129	122	140	123	125	120	135	127	132	—	119	12
28	121	—	—	129	—	126	119	109	129	125	115	120	114	116	—	110	11
65	56	—	—	51	—	62	61	60	65	—	61	60	55	65	—	65	5
16	107	—	—	103	—	114	111	104	121	113	102	112	115	112	—	121	10
71	349	—	—	374	332	369	352	353	373	363	337	367	356	360	—	350	34
96	278	—	—	305	283	293	271	290	289	282	277	270	275	291	—	297	34
40	395	—	—	450	405	420	400	410	419	407	398	403	393	404	—	419	4
20	216	—	—	257	230	260	232	226	216	243	242	222	225	221	—	236	2
19	487	500	477	521	483	512	494	482	523	503	480	495	482	485	—	503	56
78·4	78·2	77·5	76·9	76·1	78·8	75·7	74	79·7	73·5	76·5	77·6	68·5	72·7	78	75·1	76·5	
72·2	72·9	74	74	72·8	72·4	70·2	67·3	72·7	66·7	69·8	70	66·8	72·1	69·9	73·4	70·4	
98·9	93·2	95·5	96·2	93·7	91·8	92·3	91·6	91·2	90·6	91·2	90·2	97·6	99·6	89·6	97·7	92	1
—	54·5	—	55·9	44·42	53·4	57·6	55·7	50·4	44·5	50	—	52·3	51·3	50·9	48·7	48	
—	75	—	73·9	63·92	69	75·4	73·9	70·9	64·5	69·5	—	76·8	69·2	72·2	—	63·4	
—	90·2	—	87·8	—	87	—	—	87·2	—	82·2	—	—	80·3	—	—	79·7	
—	110·7	—	106·3	—	101·7	—	—	107·7	—	100·8	—	—	100·9	—	—	95·9	
69·9	70·5	—	63·6	60·82	72·1	68·7	71·1	70·2	62·4	62·1	—	63·5	66·7	67·1	63·6	64·8	
92·3	86·5	76·3	81·6	75	83·3	79·5	94·3	75·7	86·5	88·2	—	83·8	81·6	90·9	85·3	84·6	R L
51	54·5	63	61·4	60·4	53·3	52·1	54·5	58·1	74·3	58·1	—	62·2	69·2	55	55·8	59·5	
78·3	80·5	—	77·3	80	75	76·5	64·6	69·6	83·3	72·3	—	95·7	65	78·9	—	87	
22	127·3	—	125	—	114·6	127·3	107·7	106	—	120	—	124·5	111·6	123·6	—	—	1
94·1	98·9	—	96·7	—	94·9	107·5	102·1	102·2	97·8	97·8	—	104·3	97·8	102·4	98·9	101	1
10·2	42·9	—	45·6	—	40·3	—	45·7	47·8	—	—	—	45·7	—	—	—	—	
—	99·1	94·2	101·8	91	97·4	100·8	93·9	99·1	98·3	93·2	—	84·8	91·5	101·9	91·3	95·9	
95·1	106·1	105·3	105·9	105·9	108·3	105·1	106·6	105·2	107·1	111·4	—	100·9	107·9	107·2	—	107·3	
3·3	71·4	64·2	71·5	72·1	69·4	68·6	67·2	69·3	70·5	68·2	66·7	72·2	74·4	68·1	66·2	70·1	
3·7	80·5	82·8	86·9	82·1	82·8	80·3	80·2	83·9	83·5	78·8	79·5	84·1	85·6	81·5	—	86·1	
1·5	72·9	77·6	82·7	80	73·9	78·1	77·9	76·6	79·9	75·2	70·5	75·4	76	74·1	75·4	78·1	
1·5	78·2	81·3	79·2	80	75·4	73·7	80·2	73·7	77·7	76·6	—	81·8	82·5	80	83	69·3	
6·5	19·8	18·5	—	17·6	15·8	16·3	17·2	17·1	17·9	17·6	18·3	21·5	15·7	17·4	—	16	
4·2	34·7	—	—	38	34·3	35	34·7	39·7	33	34·4	35·6	36·8	35·7	36·7	—	34	
4·5	34·7	—	—	34·5	—	34·1	33·8	30·9	34·6	34·4	34·1	32·7	32	32·2	—	31·4	
1·3	30·7	—	—	27·5	—	30·9	31·5	29·5	32·4	31·1	30·3	30·5	32·3	31·1	—	31·6	
7·3	70·4	—	—	67·8	69·9	69·8	67·7	70·7	69	69·3	69·6	67	67	72	—	70·9	
2·4	44·4	—	—	49·3	47·6	48·8	47	46·9	41·3	48·3	50·4	44·8	46·7	45·6	—	46·9	

TABLE OF MEASUREMENTS OF ADULT SKULLS IN MILLIMETRES.

Museum of the Royal College of Surgeons.											Anatomical Museum, Cambridge.			Basle.	British Museum.		
Cape Colony.											Transvaal.	Cape Colony.	Koranna Cradock.	Cape Colony.	Cape Colony.	Cape Colony.	
1303C	1303D	1303E	1303G	1304	1305	1624	1625	1626	1628	1623	1758	1739	1747	M7	84, 4, 9, 1	1303A	1303F
m	f	m	m	f	f	m	f	f	f	f	m	m	m	m	f	m	m
—	1235	1280	1505	1360	1075	1292	1400	1190	1190	1410	—	1530	1420	—	1185	—	1430
181	177	172	180	179	170	184	172	173	173	179	182	187	184	186	173	185	189
137	131	137	139	137	132	126	125	135	130	137	131	143	137.5	130	131	136	135
127	120	125	126	125	119	123	124	121	127	126	132	132.5	129	139	122	121	132
94	88	95	98	93.5	88	91	93	92	86	96	89	93	96	91	91.5	91	105
119	108	116	117	116	106	106	107	110	105	118	108	116	110	—	104	120	114
110	105	115	116	108	105	106	107	110	—	118	106.5	116	95?	—	95	107	113
107	102	105	111	106	93	95	95	100	98	107	101	104	110.5	—	100	108	108
101	105	101	108	105	108	104	106	112	105	95	106	115	111	—	98	113	114
93	94	90	93	92	—	94	89	85	88	98	101.5	92	99	101	98	97	102
100	94	92	91	90	—	98	87	87	87	99	109	98	97	105	95.5	93	99
94	86	86	86.5	87	86	86.5	83	86	85	84	82.5	88.5	86	—	85	41.5	86
80	29	28	30	29	30	30	28	28	29	25	28	30	29	—	27.5	33.5	29
105	98	105	102	98	—	103	105	95	99	105	101	102	112	—	101	103	113
98	92	95	95	88	—	101	97.5	84	93	97	96.5	97	102	—	93.5	97.5	101
114	106	108	107	107	—	114	109	99	105	112	116	114	117	—	106	110	117
112	102	104	100	100	—	113	106	98	97	108	109?	114	119	—	103	—	112
99	90	84	85	95	—	104	90	82	88	91	95	96.5	105	95	89	98	92
118	115	117	119	118	—	125	117	108	115	123	123	124.5	131	130	118.5	124?	130
89	85	83	77	82	—	96	81	78	—	78	91	91	93	—	89.5	85	84
68	64	59	53	59	—	60	60	55	56	59	65.5	66	68	—	64	64	61
22	22	22	18	17	—	22	21	16	15	17	24.5	21	22	—	20	18	18
—	—	126	—	119	—	—	118	—	—	118	—	136	137	—	128	—	—
—	—	102	—	97	—	—	94	—	—	98	—	113	112	—	103	—	—
22	19	23	16	23.5	—	24	20	21	18	18	24	22	29	—	21	23	21
39	35	37	37	34	—	37	38	33	34	39	37	38	39	40	36	39	R40 L39
81	33	28	32	30	—	31	31	30	29	33	R36 L31		30	33	35	31	34
26	24	22	22	22	—	24	22	20	23	20	24	21.5	23	—	23	22	25
48	44	43	35	43	—	45	39	40	43	42	42	47	47	53	44	45	45
25	24	25	26	25	—	28	27	22	24	25	28	31	25	27	24	23	27
55	52	50	46	50	—	53	47.5	44.5	—	52	63.5	57	51	—	52	49	50
51	48	46	42	47	—	47	40	38	—	46	56.5	50	42	—	45	44	46
70	56	53	82	60	—	66	53	55	—	—	66	66	61	—	55	58	60
80	81	32	35	34	—	45	26	30	—	40	36	40	35	—	33	37	35
38.5	37	38	44	41	—	45	34	38	—	40	43	47	41	—	39	34	39
—	43	43	—	—	—	43	—	—	—	—	44	43	40	—	40	—	—
109	98	100	102	98	—	102	105	90	—	104	105	103	110	—	102	104	109
21	21	24	22	22	22	29	20	23	—	19	57	24	25	—	25	—	21
120	122	140	123	125	120	135	127	132	—	119	130	142	131	—	115	—	135
126	119	109	129	125	115	120	114	116	—	110	119	127	136	—	118	—	120
62	61	60	65	—	61	60	55	65	—	65	56	67	60	—	60	—	70
114	111	104	121	113	102	112	115	112	—	121	118	115	110	—	108	—	119
369	352	353	373	363	337	367	356	360	—	350	367	384	377	—	341	—	374
393	371	390	389	382	277	270	275	291	—	297	301	291	292	—	275	—	293
420	400	410	419	407	398	403	393	404	—	419	410	463	435	—	393	—	421
260	232	226	216	243	242	222	225	221	—	236	237	237	227	—	235	230	247
512	494	482	523	503	480	495	482	485	—	503	505	522	516	—	489	509	525
75.7	74	79.7	73.5	76.5	77.6	68.5	72.7	78	75.1	76.5	72	76.5	74.7	69.9	75.7	73.5	71.4
70.2	67.8	72.7	66.7	69.8	70	66.8	72.1	69.9	73.4	70.4	72.5	70.9	70.1	75.9	70.5	65.4	69.8
92.3	91.6	91.2	90.6	91.2	90.2	97.6	99.6	89.6	97.7	92	100.8	92.7	93.8	106.9	93.1	89	99.8
57.6	55.7	50.1	44.5	50	—	52.8	51.3	50.9	48.7	48	53.3	53	51.9	55.4	54	51.6?	46.9
75.4	73.9	70.9	64.5	69.5	—	76.8	69.2	72.2	—	63.4	74	73.1	71	—	75.5	68.5?	64.6
—	—	87.2	—	82.2	—	—	80.3	—	—	79.7	—	90.8	85.5	87.7	86.9	—	—
—	—	107.7	—	100.8	—	—	100.9	—	—	95.9	—	109.2	104.6	—	108	—	—
68.7	71.1	70.2	62.4	62.1	—	63.5	66.7	67.1	63.6	64.8	68.9	68.4	64.8	73.5	71.9	65.3	66.3
79.5	94.3	75.7	86.5	88.2	—	83.8	81.6	90.9	85.3	84.6	R80.9 L83.6		78.9	84.6	90	91.7	79.5
52.1	54.5	58.1	74.3	58.1	—	62.2	69.2	55	55.8	59.5	66.7	62.8	53.2	50.9	54.5	51.1	60
76.5	64.6	69.6	83.3	72.3	—	95.7	65	78.9	—	87	63.7	80	83.3	64.5	73.3	84.1	76.1
127.3	107.7	106	—	120	—	124.5	111.6	123.6	—	—	103.9	115.8	120	—	97.4	118.4	120
107.5	102.1	102.2	97.8	97.8	—	104.3	97.8	102.4	98.9	101	107.4	106.5	98	101	97.9	95.9	88.2
—	45.7	47.8	—	—	—	45.7	—	—	—	—	43.3	46.7	40.4	—	40.8	—	—
100.8	93.9	99.1	98.3	93.2	—	84.8	91.5	101.9	91.3	95.9	87.8	93.2	84	—	77.2	96.8	87.7
105.1	106.6	105.2	107.1	111.4	—	100.9	107.9	107.2	—	107.3	103.5	106.2	107.9	—	108.7	106.7	107.9
68.6	67.2	69.3	70.5	68.2	66.7	72.2	74.4	68.1	66.2	70.1	68	65	69.8	—	69.8	66.9	77.8
80.3	80.2	83.9	83.5	78.8	79.5	84.1	85.6	81.5	—	86.1	81.3	81.1	69.1	—	72.5	78.7	83.7
78.1	77.9	76.6	79.9	75.2	70.5	75.4	76	74.1	75.4	78.1	77.1	72.7	80.4	—	76.4	79.4	80
73.7	80.2	73.7	77.7	76.6	81.8	82.5	80	83	80.8	69.3	80.9	80.4	80.7	—	74.8	83.1	84.4
16.3	17.2	17.1	17.9	17.6	18.3	21.5	13.7	17.4	—	16	20.8	16.9	19.1	—	21.7	—	15.6
35	34.7	39.7	33	34.4	35.6	36.8	35.7	36.7	—	34	35.4	37	34.7	—	33.7	—	36.1
34.1	33.8	30.9	31.6	34.4	34.1	32.7	32	32.2	—	31.4	32.4	33.1	36.1	—	34.6	—	32.1
30.9	31.5	29.5	32.4	31.1	30.3	30.5	32.3	31.1	—	34.6	32.2	29.9	29.2	—	31.7	—	31.8
69.8	67.7	70.7	69	69.3	69.6	67	67	72	—	70.9	73.4	62.9	67.1	—	69.1	—	69.6
48.8	47	46.9	41.3	48.3	50.4	44.8	46.7	45.6	—	46.9	46.9	45.4	44	—	48.1	45.2	47

HOTTENTOTS.

Museum of the Royal College of Surgeons.

Colony.	Whittlesea; North Victoria; Cape of Good Hope.	Cape Shiloh, Colony.	Kitchen midden near Cape St. Francis.	Koranna.	From a cave in Makapan's country, and probably belonging to the tribe of that name.						Cape Colony.	Graham's Town, Cape of Good Hope.	Cape Colony.		
1303F	1296	1298	1298A	1299	1299A	1299B	1299C	1299D	1299E	1299F	1622	1618	1619	1620	1621
m	m	f	f	m	f	m	f	m	m	f	f	f	f	f	f
1430	1400	1380	1320	1490	1445	1350	1275	1305	1530	1340	1312	1272	1370	—	—
189	185	178	179	191	184	185	182	178	181	175	174	169	181	178	179
135	130	135	141	140	129	128	124	128	131	127	133	129	136	131	138
132	138	130	123	134	133	128	129	128	128	126	122	119	132	131	124
105	100	96	93	95	101	98	91	96	87	—	101	91	97	91	94
114	111·5	117	115	115	116	108	109	112	115	—	114	114	113	110	117
113	107	117	115	93	111	108	107	112	114	—	114	114	112	106	117
108	107	106	105	104	110	102	97	98	100	—	110	102	109	102	108
114	110	110	105	112	99	107	102	98	101·5	—	105	100	109	101	106
102	107	98	91	98	105	98	96	95	90	90	96	87	98	98	92
99	112	90	93	104	105	100	95	94	91	91	99	91	100	99	91
36	34	37	35	38	38	34	34	39	38	—	41	32	35	36	35
29	30	30	26	29	30	28	27	27·5	30	—	32·5	25	28	28	27
113	117	105	101	104	109	104	100	100	91	—	109	98·5	103	95	101
101	109	97	94	95	99	94	94	95	85	—	101	90	95	88	95
117	127	112	107	117	117	115	106	107	96	—	120	100	110	102	108
112	123	111	107	114	112	106	104	104	93	—	109	98	107	99	103
92	100	89	90	100	99	89	90	87	81	—	96	81	90	87	91
130	137	121	117	131	—	124	—	116	—	—	133	109	—	111	121
84	93	82	78	91	88	96	82	74	83	—	82	84	87	74	76
61	64	58	59	65	69	69	60	55	66	—	63	63	62	57	58
18	21	14	20	19	23	17	19	19	23	—	17	24	17	16	17·5
—	144	—	118	—	—	—	—	—	—	—	—	124	132	—	—
—	113	—	98	—	—	—	—	—	—	—	—	104	107	—	—
21	25	18	19·5	25	20	19·5	21	17	17	—	21	18	22	19·5	18
R40 L39	43	39	36	37	37	36	37	38	34	—	37	36	35	34	36
34	31	32	27	32	34	39	32	30	33	36	33	32	30	34	32
25	23	21	21	21	24	20	24	23	22	30	26·5	22	19	22	23
45	44	45	40	48	47	55	43	38	45	36	46	41	46	43	42
27	27	26	25	27	25	28	26	22	22	22	30	27	25	24	26
50	59	45	52	56	58	54	51	51	50	—	55	53	53	52	53
46	53	42	48·5	54	50	47	48	47	46	—	47	44	51	49	46
60	62	58	57	66	67	62	59	57	54	—	57	53	58	56	60
35	37	38	32	41	36	37	31	29	27	—	81	31	35	28	39
39	38	37	40	42	42	—	35	40	—	—	39	33	40	41	37
—	43	—	41	42	44	—	—	—	—	—	—	40	42	—	40
109	117	101	102	98	106	102	99	103	93	—	108	98	101	97	102
21	32	24	20	25	19	25	21	18	18	—	18	19	26	19	—
135	125	133	135	130	137	130	133	123	130	—	114	—	124	125	—
120	126	122	124	134	126	130	123	124	131	—	125	—	129	129	—
70	60	70	60	60	57	61	65	50	60	—	55	—	62	55	—
119	110	108	109	119	110	112	112	109	112	—	102	—	106	103	—
374	361	363	368	383	373	372	368	356	373	—	341	—	359	357	—
293	292	306	305	295	287	286	296	289	300	—	285	—	291	295	—
421	450	432	426	438	419	430	419	412	422	—	426	—	420	425	—
247	239	211	242	252	246	245	254	235	212	—	248	—	217	231	—
525	507	502	488	533	510	511	498	492	500	485	484	—	506	462	—
71·4	70·3	76·8	78·8	73·3	70·1	69·2	68·1	71·9	72·4	72·6	76·4	76·3	75·1	78·6	77·1
69·8	74·6	73	68·7	70·2	72·3	69·2	70·9	71·9	70·7	72	70·1	70·4	72·9	73·6	69·3
99·8	106·2	96·3	87·2	95·7	103·1	100	104	100	97·7	99·2	91·7	92·2	97	100	89·9
46·9	46·7	47·9	50·4	49·6	—	55·6	—	47·4	—	—	47·4	57·8	—	51·4	47·9
64·6	67·9	67·8	66·7	69·5	—	77·4	—	63·8	—	—	61·7	77·1	—	66·7	62·8
—	82·5	—	83·8	—	—	—	—	—	—	—	—	95·4	—	—	—
—	105·1	—	100·9	—	—	—	—	—	—	—	—	113·8	—	—	—
66·3	64	65·2	65·6	65	69·7	77·5	66·7	63·2	81·5	—	65·6	77·8	68·9	65·5	63·7
RS5 187·2	72·1	82	75	86·5	91·9	108·3	86·5	78·9	97·1	—	89·2	88·9	85·7	100	88·9
60	61·4	57·8	62·5	56·3	53·2	50·9	60·5	57·8	48·9	61·1	65·2	65·9	54·3	55·8	61·9
76·1	69·8	90·5	66	75·9	72	78·7	64·6	61·7	58·7	—	66	70·5	68·6	57·1	84·8
120	105·1	128·9	109·6	117·8	115·5	114·8	115·7	111·8	108	—	103·6	100	109·4	107·7	113·2
88·2	104·7	91·8	102·2	106·1	100	102	99	98·9	101·1	101·1	103·1	104·6	102	101	98·9
—	40·2	—	45·1	42·9	41·9	—	—	—	—	—	—	46	42·9	—	43·5
87·7	81·4	96·7	98·3	87·8	—	87·1	—	96·6	—	—	85·7	104·6	—	99·1	96·7
107·9	107·7	104·1	108·2	103·1	107	108·2	105·3	108·2	109·4	—	106·8	108·8	106·3	110·4	107·4
77·8	76·9	71·1	66	67·9	78·3	76·6	73·4	75	66·4	—	75·9	70·5	71·3	69·5	68·1
83·7	82·3	86·7	81·6	66·4	86	84·4	86·3	87·5	87	—	85·7	88·4	82·4	80·9	84·8
80	82·3	78·5	74·5	74·3	85·3	79·7	78·2	76·6	76·4	—	82·7	79·1	80·1	77·9	78·3
84·4	81·6	81·5	74·5	80	76·7	83·6	82·3	76·6	65·5	—	78·2	77·5	80·1	77·1	76·8
15·6	25·6	18	14·8	19·2	13·9	19·2	15·8	14·6	13·8	—	15·8	—	21	15·2	—
36·1	34·6	36·6	36·7	33·9	36·7	34·9	36·1	34·6	34·8	—	33·4	—	34·5	35	—
32·1	34·9	33·6	33·7	35	33·8	34·9	33·4	34·8	35·1	—	36·6	—	35·9	36·1	—
31·8	30·5	29·8	29·6	31·1	29·5	30·1	30·4	30·6	30	—	29·9	—	29·5	28·9	—
69·6	64·9	70·8	71·4	67·4	68·5	66·5	68·3	70·1	71·1	—	66·9	—	69·3	69·4	—
47	47·1	48	49·6	47·3	48·2	47·9	51	47·8	42·4	—	51·2	—	42·9	50	—

CRANIA of AFRICAN BUSH RACES.

By F. SHRUBSALL, Esq., B.A.

[WITH PLATE XVI.]

BEFORE proceeding to the consideration of this subject, I desire to thank Professor Stewart, curator of the museum of the Royal College of Surgeons, and Mr. Oldfield Thomas, of the British Museum, for the great kindness with which they afforded me every facility in their power for the examination of the specimens in the collections under their care. I also desire to express my thanks to Professor Macalister for much of the material on which this paper is based and also for valuable help and suggestions during its progress.

In working through any series of crania collected from a wide area, it is well to begin with those of the oldest and presumably least mixed populations, as thereby we obtain a fixed datum from which to proceed. On this account, in my systematic studies of African craniology I have taken the Bush races first, as they are now generally considered to have been among the earliest inhabitants of the southern part of the Dark Continent. Their range of distribution was originally much wider, and it is probable that it is only within the last two thousand years that they have been restricted to their present locality by the pressure of immigrant races.

In this paper I propose to describe the skulls of Bushmen and Hottentots in separate sections, not that craniologically any sharp dividing line can be drawn between them, but rather because the remains of the former compose a tolerably distinct and homogeneous series, while those of the latter exhibit various transitional types intermediate between the Bush race proper and the surrounding Kaffir and Negro tribes.

In the table of seriations I have included the indices given for Bush crania by Fritsch, Rolleston, and Sir William Turner in their respective memoirs.

I.—*Bush Race of South Africa.*

These aborigines are fast disappearing, and are now only to be found as a few scattered groups along the south bank of the Orange river, in some of the valleys of Griqualand, and in isolated localities in Kaffraria. They still survive, however, in greater

numbers in the fastnesses of the Kalahari desert and along the border-line of Bechuanaland and German South-west Africa. Their remains are to be found throughout the whole of Cape Colony, especially along the sea-coast from Cape Agulhas to Algoa Bay.

I have measured twenty-six crania belonging to this ethnic group, the number being made up of three Strandloupers, or coast Bushmen, from Port Elizabeth and two Bushmen of the Transvaal tribe which are in the Anatomical Museum at Cambridge, one of the Transvaal tribe in the Vesalianum at Basle, two skulls from Khama's country, north of British Bechuanaland, found in the Kalahari desert (long. 26° E., lat. 20° S.) by Mr. R. T. Cunningham and by him deposited in the British Museum, the tale being completed by sixteen crania in the museum of the Royal College of Surgeons.

We may commence detailed observations by an examination of the *cranial capacity*, which was in every case taken by the modification of Broca's method introduced by Sir William Turner, with the exception that separate litre and half-litre measuring tubes were employed instead of the two-litre vessel as used by him. The mean of at least three measurements of every skull was taken, any observations differing by more than 10 c.c. from the average being rejected. In the table of measurements I have included the capacities of the crania in the museum of the Royal College of Surgeons as given in the catalogue, pressure of time having prevented me from recubing them. It is at once apparent that while there is a considerable range of individual variation among skulls belonging to the Bush race, yet the great majority are microcephalic, having a capacity of less than 1350 c.c. The measurements of the series of male skulls are very concordant, the one from the Transvaal in the museum at Basle having a capacity of 1405 c.c., the male Strandlouser one of 1355 c.c., while the cranium from the Kalahari desert has the smaller volume of only 1220 c.c., the average capacity for all the male skulls examined being 1327 c.c. The female series, however, is not so homogeneous, one of the Strandloupers running up to the high figure of 1515 c.c., while the second has a capacity of only 1185 c.c.; the specimen from the Transvaal tribe has also the considerable capacity of 1390 c.c., thus raising the average of the series to 1363, whereas the greatest capacity previously recorded for female crania of the Bush race was 1360, being that of a skull in the museum of the College of Surgeons. More capacious male crania had, however, been noted by Turner and also by de Quatrefages and Hamy. Comparing the foregoing averages with those embodied in previous descriptions, we find—

	Male.	Female.
Cambridge Collection	1327	1363
Collection of Royal College of Surgeons ..	1400	1214
Barnard Davis Collection	1304	1274
Turner, "Challenger" Report	1319	1092
Fritsch, "Sud Afrikas Eingeborenen" ..	1352	1214

To this comparison there is, however, the considerable drawback that the capacities were not taken in the same manner in all instances.

The mean in cases where the crania were cubed with shot appears to be—male 1331 c.c., female 1255 c.c., giving a mean sexual difference of 76 c.c.

The following table contrasts Bush skulls with other similar races :—

	Male.	Female.
Bushmen	1331	1255
Akkas	1102	1072
Andamanese	1244	1128
Sicilian Pigmy	1031	—
Schaafhausen Pigmy	1207	—

Viewed in *norma verticalis*, these crania usually present the appearance of a fairly uniform, occipitally elongated oval, with well-developed frontal and parietal eminences, the former being either separate and distinct or fusing across the mid-sagittal line. In some cases both frontal and parietal eminences are distinct enough to give the skull the appearance, when viewed in this norma, of having been annularly compressed along the line of the coronal suture. Such crania would be described by Professor Sergi as rhomboid. The cranial vertex is somewhat flattened, such flattening being especially noticeable between the parietal eminences in the neighbourhood of the obelion. The coronal, sagittal, and lambdoid sutures are remarkably simple, and wormian bones especially at the lambda are conspicuous by their absence. Only one skull in the whole series examined is metopic; this skull is also characterised by a large median wormian bone in the hinder part of the sagittal suture. Normally there is no median sagittal ridge, but some of the inland crania have traces of it with a marked groove on the posterior half of the parietal bone in which the suture lies. The majority of skulls are cryptozygous, but in some of the Transvaal specimens the zygomatic arches are just visible, and

indeed the prominence and strength of these processes is a distinguishing feature of the Transvaal and Kalahari tribes as compared with the Strandloupers from the south-eastern seaboard of Cape Colony.

The mean transverse dimensions of the cranial vault appear in the following table :—

Diameter.	Male.		Female.	
	Absolute measurements in millimetres.	Relative to max. B = 100.	Absolute measurements in millimetres.	Relative to max. B = 100.
Minimum frontal	97	71·3	96	69·6
Maximum frontal	111	81·6	121	87·7
Bi-stephanic	103	75·7	115	83·3
Inter-pterial	107	78·7	103	74·6
Bi-asteric	107	78·7	107	77·5
Maximum transverse ..	136	100	138	100

The narrowness of the female crania at the level of the pterion and their relative breadth above that point brought out in this table is worthy of notice. To this character the name *stenocrotaphism* has been given.

The mean *fronto-zygomatic index* of Bushman skulls is—for males 90·3, for females 96, and for both sexes together 94·6. *Cf.* Hottentots, 93·2; Andamanese, 87·6; Negroes, 84·5.

The *stephanio-zygomatic index* is 86·3 for males and 92·3 for females. *Cf.* Hottentots, 93·2; Kaffirs, 88·8.

The mean *cephalic index* of the skulls in the Anatomical Museum at Cambridge is 73·2 in the case of males and 77·6 in that of females. The male skull from the Transvaal at Basle has an index of 76·9, while the indices of those from the Kalahari desert are 78 and 78·4 for male and female respectively. The total mean for all the Bush crania examined is—male 75·2, female 76·8, practically identical with the numbers given by Turner in the "Challenger" reports, viz. 75·8 and 76·5, and close to those quoted by Fritsch in his monograph on the aborigines of South Africa: 74 and 75·2. The total mean index of 75·2 given by Turner for all the thirty-six Bush crania of which measurements were then available becomes, when the additional skulls described in this paper are incorporated, 75·4.¹ *Cf.* Akkas, 77·5; Andamanese, 81·6; Sicilian Pigmy, 71·2; Schaafhausen Pigmy, 71·4.

Comparisons of the distribution of the indices of the Bush

¹ The average index of the Netley Collection is 75·9

skulls, according to Broca's classification, are shown in the following table, the first two divisions containing only crania whose measurements are given at the end, the third comprising also those described by Sir William Turner, Fritsch, and others:—

	Male.	Female.	All Crania.
Brachycephalic	—	—	—
Sub-brachycephalic	—	—	3·4
Mesaticephalic	14·8	40·9	15·5
Sub-dolichocephalic	41·4	27·3	46·5
Dolichocephalic	40·7	31·8	34·5

When the skulls are viewed in *norma lateralis*, the most prominent features are the fulness of the forehead, the want of projection of the face as a whole, and more especially of the nose, and the fulness and backward projection of the occipital region.

The face is much flattened, the nasal bones being almost invisible in profile, and the alveolar border of the maxilla but slightly projecting, while the incisor teeth are set in their sockets scarcely, if at all, obliquely. The chin in the majority of instances is weak and receding, while the malar bones, on the other hand, are voluminous and prominent. This group would appear to be one in which the *alveolar index* of Sir William Flower is not very reliable as a race character, the range 91–107·5 being very great, far greater indeed than the variations of prognathism as estimated by the eye, to which almost all Bush crania appear orthognathous.

The mean index for males is 101·5 and for females 99·2, as compared with 96·5 with a range of 9 units and 99·8 with a range of 5 units, the figures given by Sir William Turner in the "Challenger" report.

The same difficulty with regard to the wide range of variation of prognathism in otherwise typical skulls has been noted by the authors of "Crania Ethnica" in the course of their description of the Hottentot-Bushman ethnic group.

The distribution among the various groups is indicated in tabular form below:—

	Male.	Female.
Orthognathous	40	46·7
Mesognathous	23·7	46·7
Prognathous	33·3	6·7

Cf. Akkas, 106·5; Andamanese, 102; Sicilian Pigmy, 88·4.

The profile of the forehead is in most cases continued by that of the upper part of the nasal bones, the nasion not being at all depressed, and the glabella only slight, although superciliary ridges are rather more plainly marked. Among the inland Bushmen, however, the face has a sterner appearance, the glabella being more prominent and overhanging the root of the nose, while the superciliary ridges are much stronger.

The forehead in all cases is full and rounded, and the sagittal curve is vertical for the anterior third of the frontal bone, on the average the sub-cerebral portion contributing in the male 23·3 and in the female 17·8 per cent. of the total frontal curve. Among the marked features of the sagittal curve in South African races are, firstly, a transverse post-bregmatic concavity extending for about a quarter of the length of the parietal bone, producing an appearance as if the head in this region had been submitted to annular compression, and, secondly, a well-marked flattening of the curve and of the cranial vertex in the region of the obelion, both these latter points being perhaps rather plainer in Kaffir than in Bush skulls. In many calvaria of the latter race, there is a distinct prominence and bulging out of the squama of the occipital bone, or it may be of the whole occipital region. This condition (frequently associated with wormian ossicles along the line of the lambdoid suture, which are, however, almost invariably absent in Bushman crania) is rare among Europeans, unusual in the northern Negroes, present occasionally among the more southerly Bantu-speaking peoples, though fairly common among the Hamitic races.

From the inion, which is poorly marked, the sagittal curve passes gently downwards and forwards to the opisthion, the bone in this region being smooth and but slightly marked by muscular impressions.

In the following table will be found the relative measurements of the components of this curve, the lengths of the various portions being contrasted with the total sagittal curve (= 100):—

	Frontal.	Parietal.	Occipital.
Male	35	35·6	29·3
Female	35·2	34·7	30·1

The ratio of the pre-auricular to the total horizontal curve (= 100) is in males 44·4 and in females 43·9.

Conspicuous features in this norma are the well-marked lineæ temporales, bounding the temporal fossa and curving round the posterior border of the parietal bone to join the inner, the strong post-zygomatic ridge, and the outer, a ridge running on to the

mastoid, gradually becoming more prominent till it ends at the tip of the process. The mastoid process is small, but roughened, and strongly marked with an unusually well cut digastric groove. Between the above ridges there passes a narrow, fairly deep supra-mastoid groove, running in a curved manner down the temporal bone and causing the mastoid process to stand out with a distinctly greater prominence than one would expect from consideration of its size alone. This association of a prominent supra-mastoid groove with small, well-cut mastoid processes would appear to be a distinctive feature of the skulls of the Bush-Hottentot ethnic groups, and its presence or absence is a guide of some value in all attempts to decipher the affinities of the various tribes of South Africa from a study of their osteological characters.

In Bush crania the squama of the temporal bone is somewhat flattened, but the zygomatic fossa is shallower just below the level of the squamous suture than above it. The temporal bone is separated by a broad, deep, well-marked groove or gutter from the lateral surface of the frontal, which bulges out into the temporal fossa, giving an irregular appearance.

The pterion, except in one case (which has a fronto-squamosal articulation), is of the normal H or N shape, although the process of the great wing of the sphenoid is usually very long and narrow. In only one instance is there a wormian bone in this situation, and anomalies of articulation of any kind are rare. In one skull the lips of the spheno-squamous suture project outwards as a ridge passing on either side down the fossa, the anterior third of which it converts into a deep gutter. The conceptaculæ cerebelli are full and well developed, so that most of the skulls rest upon them when placed on the table; but in some of the inland Bush crania the mastoid processes are of sufficient length to act as supports in this position in the place of the conceptaculæ or the occipital condyles.

The relation of length to height as seen in this norma is expressed by the altitudinal index 70·8 in the male and 71·2 in the female, so that the Bush skulls would appear to be orthocephalic, though on the border-line of chamæcephalism. *Cf.* Akkas, 76·1; Andamanese, 77·9; Sicilian Pigmy, 77·3.

Classifying the crania according to this index, we obtain the following table of percentages:—

	Male.	Female.
Chamæcephalic	42·3	40·9
Orthocephalic	46·2	59·1
Hypsicephalic	11·5	—

Viewed in *norma occipitalis*, the cranium sometimes appears pentagonal, with flattened sides, but more often the roof is rounded off in a wide curve. This flattening of the vertex is usually given as a characteristic of skulls of the Bush race.

The *breadth-height index* is 96 in males and 91·4 in females, the percentages in the various divisions being—

	Male.	Female.
Akrocephalic	6·7	21·1
Metriocephalic	80	31·6
Tapeinocephalic.. .. .	13·3	47·4

The relationship of the supra-auricular portion to the total transverse curve (= 100) is in the male 69·7 and in the female 68·5.

Norma facialis.—Turning from a study of the cranium to examine the face, there appears at first sight to be a comparative uniformity throughout the entire series, which greatly simplifies the labour of description; and although on closer inspection this is not entirely borne out, the differences which appear are those of degree rather than of kind. In all there is a broad, full forehead, with distinct frontal eminences, prominent external angular processes, rendered yet more conspicuous by a slight depression on the bone superior and internal to them, comparatively large and forwardly projecting cheek-bones, a broad, depressed nose, and a generally orthognathous face, with weak, receding chin. The orbits as a rule are small and microsome, with strong borders and a wide interorbital space, the latter being due to a flattening and widening of the ascending processes of the maxillæ, which in these crania form part of the bridge as well as of the side walls of the nose. The nasal bones, nearly flat from side to side and from above downwards, are set at a very open angle to one another, merely serving to roof in the space between the nasal processes of the maxillæ and not themselves contributing to the prominence of the bridge. The side walls of the apertura pyriformis (which is very broad compared with its height) round off into the floor, and this into the anterior surface of the superior maxilla, the lower border being, however, rather sharper than in the Hottentots or West Coast Negroes.

The nasal spine is very weak and inconspicuous, as in all the black races of Africa, while the upper jaw is broad and slight, with very distinct incisive and canine fossæ. The palate is parabolic, and contains in its alveolar border perfectly healthy,

though frequently much-worn-down teeth. The mandible is slight and characterised by a roughened and frequently everted angle, but especially by a short coronoid process, the sigmoid notch being in consequence remarkably shallow. Considerable variations, however, apart from those due to sex, occur in the degree of prominence of the glabella and superciliary ridges, in the prognathism of the maxilla, and in the obliquity of the teeth in their sockets.

Further details are best brought out by a study of the various facial indices tabulated in order below:—

Superior facial index of Broca.—Mean for males, 69·7; females, 70·2. *Cf.* Hottentots (Broca), 66·6; Kaffirs, 71·7; Akkas, 63·7.

Upper facial index of Kollmann.—Mean for males, 52·5; females, 47·6.

The skulls therefore lie on the border-line between lepto and chamæprosopy, the females being included in the latter class in greater numbers than the males, in whom the face is of a somewhat irregular nature.

The distribution according to a modification of Professor Kollmann's classification (in which a leptoprosope mesocephal division not recognised for European skulls is introduced) is—

	Male.	Female.
Chamæprosope dolichocephals	14 3	—
Chamæprosope mesocephals	21 4	38 5
Chamæprosope brachycephals	—	7 7
Leptoprosope dolichocephals	21 4	15 4
Leptoprosope mesocephals	35 7	38 5
Leptoprosope brachycephals	7 1	—

Owing to injuries to the skull, in several cases rendering it impossible to measure the bi-zygomatic breadth, the *upper facial index of Virchow*, in which the naso-alveolar height is compared with the bi-maxillary breadth, becomes of especial interest. It is in males 65·6 and in females 66·2. *Cf.* true Hottentots, 68·4; Korannas, 64·9; Kaffirs, 75·1; Angonis, 72·7; West Coast Negroes, 66·8.

The results obtained by its employment are thus seen to be very concordant with those derived from the other facial indices, with the great advantage that it can be found for many skulls in which the data for the latter cannot be obtained.

The breadth relations of the face are most clearly seen in a table in which the various diameters are compared with the ophryo-alveolar height (= .100):—

					Jugal.	Malar.	Maxillary.
Male ..	..	..	..	..	125·2	125·7	108·3
Female ..	..	..	..	..	137·2	135·9	108·9

The mean *orbital index* is for males 78·5, females 84·9, the range in the seriation table being 66–95, with maxima at 76 and 85, showing the comparatively microseme nature of Bush crania. Cf. Hottentots (Broca), 84·5; Akkas, 82·9; Andamanese, 91·7; Sicilian Pigmy, 88·9.

The orbits are occasionally asymmetrical, there being a difference of one or two units between the indices on the right and left sides respectively.

The *nasal index* shows a range from 48 to 74, with an average of 60·2 for males and 61·8 for females. Cf. Hottentots, 57·6; Akkas, 59·4; Andamanese, 50·9; Sicilian Pigmy, 58·5.

This intense platyrrhiny is very characteristic of Bushmen and Bush intermixtures in Africa.

The general features and “cast of countenance” of the facial skeleton can be observed from a combined table in which the facial, orbital, and nasal indices are classified in accordance with Broca’s terminology:—

					Male.			Female.		
					Facial.	Orbital.	Nasal.	Facial.	Orbital.	Nasal.
Microseme ..	..	45·4	46·4	6·7	25	28·6	—			
Mesoseme ..	..	18·2	46·4	26·7	16·7	42·9	—			
Megaseme ..	..	36·4	7·1	66·7	58·3	28·6	100			

The mean naso-malar index of Oldfield Thomas is 107·1 in the case of males and 105·9 in that of females, thus showing the crania to be platyopic.

The general form of the parabolic palate is indicated by the subjoined list of indices:—

					Male.	Female.
Staphylinic (Virchow) ..	..	..	..	..	70·5	70·3
Uranic (Flower) ..	..	..	..	..	111·1	107
Dental ..	..	..	..	..	44·5	43·1

The mandible is characterised by the shortness of the coronoid and condylar processes and by the narrow, pointed chin, and has a mean *gonio-zygomatic* index of 73·3. Cf. Hottentots, 70·7; West Coast Negroes, 71·4; Kaffirs, 74.

The results of the foregoing measurements may be briefly summarised by describing Bush crania as sub-dolichocephalic, metriocephalic, orthognathic, mesoseme, platyrrhine, leptostaphylinic, cryptozygous, and microcephalic.

II.—*Hottentots.*

The Hottentot race is usually subdivided into three main branches:—

The true *Hottentots*, who are found on the western and south-eastern borders of Cape Colony, but in greatest numbers and purest strain in Namaqualand and Southern Damaraland; the *Griquas*, a mongrel stock with a Hottentot basis inhabiting East and West Griqualand at the junction of the Orange and Vaal rivers; and the *Korannas*, or *Koraquas*, surviving in the valleys of the Upper Orange, Vaal, and Modder, and on the banks of the Central Hart river in British Bechuanaland, the tribes on the latter being known as the Korannas of Mamusa.

As far as craniological characters are concerned, the Korannas would appear to be somewhat separated off from the other groups of their race and to more closely resemble the Kaffirs, with whom they have been in contact for a long time, while the Western Hottentots have only in quite recent times come into collision with the eastern and central divisions of the Bantu-speaking peoples by the migration westwards of the Ba-Mangwato Bechuanas, their previous relations having been solely with the Ova-Mpo and Ova-Herrero tribes.

The hill Damaras appear to be intermediate between the Bushmen and the true Nama Hottentots, but as yet specimens for a more detailed study of the populations of this part of Africa are not available.

No hard and fast dividing line can be drawn from craniological evidence between the Hottentots and the Bushmen on the one hand and the negroid races on the other, various transitional forms being found; but in the true Hottentots Bushman characters undoubtedly predominate. This agrees perfectly with the descriptions of Galton in his "Tropical South Africa," where he says, "The Namaqua Hottentot is simply the reclaimed and somewhat civilised Bushman, just as the Oerlams represent the same raw material under a slightly higher degree of polish. Not only are they identical in features and language, but the Hottentot tribes have been and still con-

tinue to be recruited from the Bushmen. Therefore when I say Oerlam, Hottentot, or Bushman, the identically same yellow, flat-nosed, woolly-haired, clicking individual must be conjured up in the mind of the reader, differing only in dirt, squalor, and nakedness according to the term employed."

Indeed, but for the fact that some of the Hottentot skulls show transitional characters towards the Negroes, especially to the tribes of the districts around the great lakes, and that the Korannas present some still more distant resemblances to the Kaffirs, the osteological relics of this race would not deserve a separate description.

For the purposes of this paper, I have examined twenty-two crania, comprising specimens from all the various subdivisions of the Hottentot race, in the Anatomical Museum at Cambridge, in the British Museum, and in the collections of the Royal College of Surgeons. Their distribution is clearly indicated by the headings of the table of measurements.

A distinctive feature of Hottentot as contrasted with Bush crania is the greater capacity, which is on the average 1420 c.c. in male and 1310 c.c. in female skulls, giving a mean capacity of 1365 c.c. for true Hottentots, which thus fall into the mesocephalic division.

The figures for Korannas are somewhat higher, viz., 1455 c.c. Cf. Kaffir, 1520 c.c.; West Coast Negro, 1420 c.c.; Central Lakes Negro, 1430 c.c.; *Chinese*, 1425 c.c.

Viewed in *norma verticalis*, true Hottentot crania are of comparatively small size and oval in outline, but those of the Koranna are somewhat anteriorly elongated. Most of the skulls are cryptozygous, but in those of the latter subdivision both mesozygous and phænozygous forms are met with. There is as a rule a considerable degree of prognathism, which may be prominent in this *norma*. Viewed in *norma occipitalis*, the skull presents a pentagonal form, with the vault, however, in many cases rounded off into a somewhat flattened arch, this latter condition being met with in the Korannas, while a mid-sagittal keel is more common among the true Hottentots.

In *norma lateralis* characteristic Bushman features appear in all Hottentot skulls, the flattening of the face, especially in the region of the nose, the prominence and size of the malar bones, the fulness of the forehead, the flattening of the vertex, and the deep supra-mastoid groove being especially noticeable. The degree of prognathism varies considerably, but is more marked in the Namaqua than in the Koranna. In true Hottentot skulls the post-bregmatic concavity of the sagittal curve is very conspicuous, in some cases amounting to annular deformation, thus rendering the artificial origin of the former condition very

probable. An occipital *renflement* is less frequent than in Bush crania. The lineæ temporales are plainly marked especially at their terminations, but the temporal fossa as a rule is but small.

The zygomatic arches are somewhat variable in size, but usually strong and prominent, a condition which is correlated with the roughness and eversion of the angle of the mandible as well as with the wearing down of the teeth in the older skulls. The mastoid processes are usually small, but roughened and very sharply cut, this being less marked in tribes which have for a long time been in contact with the Southern Bantus. In most cases the pterion is of the normal H shape, but in three there are fronto-temporal sutures, and in many the process of the great wing of the sphenoid is very narrow. Wormian bones in this situation are not uncommon, and in a considerable number, including all the Korannas, several such bones are found in the squamous suture. The plate of the temporal bone is bulged out in this region, so that the transverse diameter below the suture exceeds that at the lower border of the parietal, the temporal fossæ being correspondingly shallow at this level.

Viewed in *norma facialis*, the characteristic width and lack of projection of the face are at once seen. The flattening is due to the great prominence of the voluminous malar bones, and the variations observed in this *norma* are due to differences in the depth and distinctness of the infra-orbital fossæ, which are much more conspicuous in the true Hottentot than in the Koranna crania, thus showing the much greater resemblance of the former to those of Bushmen. The interorbital distance is always considerable, and is due to the breadth of the ascending processes of the maxillæ. The nasal bones are usually of moderate size, but are flattened and lie in the same plane. Considerable differences, however, occur in their shape, some skulls having them of about equal width from above downwards, while in others they are much narrower in the middle of their length than at the nasion or their free extremity. In profile only the lower ends of the nasal bones appear, the upper portions being hidden beneath the maxillary processes. In some cases the flattening goes so far that the planes of the superior surfaces of the nasal bones on either side form a re-entrant angle with one another. The apertura pyramidalis is very short and broad, the floor being rounded off, though in some cases prenasal fossæ, or simian grooves, are to be found.

The nose is platyrrhine, but not so markedly so as in Bushman crania. The forehead is of moderate width, very full and vertical, the frontal eminences usually fusing across the mid-sagittal line; the glabella is very slight, but the superciliary ridges

distinct, neither being quite so well marked as in the Bush race. The orbits are large and usually mesoseme, but considerable variations in shape are to be found in an examination of this series of skulls.

The alveolar processes are rounded and in many cases projecting, but the marked prognathism of the Hottentot is mostly dental, the sockets for the incisor teeth being set somewhat obliquely. The palate is parabolic, but in some crania its shape approaches the ellipse. In the true Hottentots the mandible is comparatively slight, with a high symphysial border, short condylar and coronoid processes, a rather shallow sigmoid fossa, a narrow, pointed chin, and frequently an everted angle, in all of which characteristics they are intermediate between the Bushmen and the Negroes of the great lakes. The mandible of the Koranna, on the other hand, is strong and massive, with long coronoid processes, deeper sigmoid fossæ, higher alveolar processes, much better marked muscular impressions, and a broad, square, powerful chin, in all of which features it closely resembles the mandibles of Kaffir and Zulu skulls.

The molar teeth are large and well formed, considerably worn down in skulls beyond middle age, but in all cases well implanted and perfectly healthy; the incisors, which are small, round, thick, and truncated, show in many cases signs of having been filed down.

All the features of the skull are in accordance with the description given by Dr. Williamson of some preserved Hottentot heads now in the museum of the Army Medical School at Netley, but formerly at Fort Pitt, Chatham:—

"The head is broad and square, the face broad and flat; the forehead is straight and well arched; the ears are placed far back on the head, the distance from them to the prominent cheek-bones being very great; the malars stand forwards and outwards, and with the long, narrow, pointed chin nearly form a triangle; the breadth between the eyes is great, and there is scarcely any perceptible bridge to the nose; the nostrils are small and depressed, the greatest diameter being in the transverse direction."

The cranial sutures as a rule are simple, but sometimes pass without any intermediate stages to a condition of foliation. Only one skull is metopic.

Wormian bones are not uncommon, but an os epactale is exceedingly rare.

The following are the details of the examination, the Hottentot crania being compared in all cases with those of Kaffirs, Negroes of the lake districts (principally consisting of a series sent to the British Museum from Nyassaland by Sir H. H. Johnston, which

I hope to describe fully at some future date), and with a collection from various districts of North-west Africa, extending from the Gambia to the Gold Coast, composed chiefly of Ashantis and Dahomans.

Some comparisons with Chinese crania are inserted on account of Barrow's ingenious, though futile, hypothesis of the Asiatic origin of the Cape Hottentots.

The *cephalic index* has a range from 66 to 79, with a mean of 72·7 for males and 75·9 for females, as compared with Kaffir, 72·3; Anyanja, 73; West Coast Negro, 73·2; *Chinese*, 78·8.

The distribution in the various divisions is—

	Hottentots.	Kaffirs.	Central Lakes District Negroes.	West Coast Negroes.
Dolichocephalic	62·1	77·8	78·2	62·8
Sub-dolichocephalic ..	34·5	16·7	14·5	22·3
Mesaticephalic	3·4	5·6	5·5	9
Sub-brachycephalic ..	—	—	1·8	5
Brachycephalic	—	—	—	·8

thus indicating the intense dolichocephalism of all the black races of Africa.

The length-height, or *altitudinal index*, is in the average male 71·2 and in the female 71·5, as contrasted with Koranna, 70·1; Kaffir, 71·3; Anyanja, 72·9; *Chinese*, 75·2; and with the following distribution:—

	Hottentots.	Kaffirs.	Central Lakes District Negroes.	West Coast Negroes.
Chamæcephalic	35·1	13·9	25	12·1
Orthocephalic	56·8	55·6	53·8	39·5
Hypsicephalic	8·1	30·6	21·2	48·4

The *breadth-height index* is of greater interest as a guide to ethnic relationship. Mean for males, 97·4; females, 95·8. Cf. Koranna, 94·7; Kaffir, 98·7; Anyanja, 101·7; *Chinese*, 103; Sicilian Pigmy, 107·4.

Classifying this index according to Broca's divisions, we find—

			Hottentots.	Kaffirs.	Central Lakes Negroes.	West Coast Negroes.
Tapeinocephalic	..	..	21·9	—	—	7·1
Metriocephalic	..	..	31·2	37·5	23·4	23·8
Akrocephalic	..	..	46·9	62·5	76·6	69

The forehead is full, but the glabella only slight, the proportion of the sub-cerebral to the total frontal curve being 16·9 in the true Hottentot as against 19·1 in the Koranna.

The distribution of the sagittal curve amongst its various components obtaining in African races is indicated in the following table:—

				Frontal.	Parietal.	Occipital.
True Hottentot	..	..	..	37	33·1	29·9
Koranna	..	..	..	34·3	35·5	30·1
Bushman	..	..	..	35	35·6	29·3
Kaffir	..	..	..	35·2	33·2	31·6
Central Lakes Negro	..	..	..	35	35·1	29·6
West Coast Negro	..	..	..	33·9	35·1	31

Applying similar comparisons to other curves, we find—

				Relation of supra-auricular to total transverse curve.	Relation of pre-auricular to total horizontal curve.
True Hottentot	..	..	..	69	47·7
Koranna	..	..	..	67·2	45·6
Bushman	..	..	..	69·7	44·2
Kaffir	..	..	..	68·4	47·5
Central Lakes Negro	..	..	..	69·1	47·7
West Coast Negro	..	..	..	67·7	44·9

The mean *upper facial indices* are as follows:—

				Upper Facial (Broca).	Upper Facial (Kollmann).
True Hottentot	..	..	..	69·4	52·1
Koranna	..	..	..	70·2	50·2
Kaffir	..	..	..	71·7	53·3
Anyanja	..	..	..	70·8	52
West Coast Negro	..	..	..	71·5	48·9
Sicilian Pigmy	..	..	..	—	43

The distribution of the crania is—

			Hottentots.	Kaffirs.	Central Lakes Negroes.	West Coast Negroes.
Chamaeprosope .. ..	..	..	36·8	38·5	20	46·7
Leptoprosope .. ..	..	..	63·2	61·5	80	53·3

It is found that male Hottentots are distinctly more leptoprosopic than the females.

The *orbital index* shows a range from 72 to 100, with maxima on the seriation curve at 79 and 86 and a mean of 86·7 for males and 88·1 for females. *Cf.* Kaffir, 83·6; Anyanja, 88·3; West Coast Negro, 84·7; *Chinese*, 89·9.

The mean *nasal index* in the case of the males is 56 and in that of the females 59, with a range of sixteen units 49–67. *Cf.* Kaffir, 55·1; Anyanja, 57·3; West Coast Negro, 61·4; *Chinese*, 49·8, showing the intense platyrhiny of the Hottentots, who in this respect are inferior only to the Bushmen.

As before, the general characteristics and harmony of the face are indicated in the subjacent combined table:—

	Hottentots.			Kaffirs.			Central Lakes District Negroes.			West Coast Negroes.		
	Facial.	Orbital.	Nasal.	Facial.	Orbital.	Nasal.	Facial.	Orbital.	Nasal.	Facial.	Orbital.	Nasal.
Microseme ...	22·2	34·3	—	9·1	23·1	—	9·3	15·7	—	16·7	26·3	1·8
Mesoseme ...	27·8	31·4	25	18·2	50	20·8	—	39·2	24·1	8·3	40·4	23·2
Megaseme ...	50	34·3	75	72·7	26·9	79·2	90·6	45·2	75·9	75	33·3	75

The *alveolar index* shows a range from 88 to 110, with a maximum in the seriation curve at 102, the mean index for males being 101·9 and for females 100·3. *Cf.* Korannas, 102; Kaffirs, 99·8; Anyanjas, 100·9; West Coast Negroes, 99·9; *Chinese*, 99.

The distribution observed on classification is—

			Hottentots.	Kaffirs.	Central Lakes District Negroes.	West Coast Negroes.
Prognathic .. ..	..	..	33·3	37·5	41·3	50
Mesognathic .. ..	..	..	50	29·2	47·8	38
Orthognathic .. ..	..	..	16·7	33·3	10·9	12

The parabolic palate has a mean *staphylinic index* of 71·2 for both sexes, a mean *uranic index*, male 111·5 and female 109·9, and a *dental index* of 41·5 in the male and 43·5 in the female skulls.

	Staphylinic.	Uranic.	Dental.
<i>Cf.</i> Koranna	79·6	118·9	41·6
Kaffir	68·5	110·7	42·5
Anyanja	68·6	111	42·3
West Coast Negro	69·7	109·7	43·9

The great flattening of the nasal region of the face is clearly indicated in the table showing the naso-malar indices of the various races:—

True Hottentot	107·1
Koranna	105·1
Kaffir	106
Anyanja	107·2
West Coast Negro	106·4

all thus falling into the platyopic subdivision.

Summing up the results of the foregoing classifications, the true Hottentot skull may be briefly described as dolichocephalic, akrocephalic, leptoprosopic, mesoseme, platyrrhine, and leptostaphylinic.

III.—*General Conclusions.*

A survey of the foregoing measurements and of the tables of seriations shows that the Bushmen proper are in most of their features clearly separated off from the surrounding black races. The Hottentots, on the other hand, are seen to be intermediate in their characters.

The *cephalic* and *altitudinal* indices present monomorphic curves with no special features of interest, the summit of both curves being at about the same position in all the African races.

The curve of the *breadth-height* indices is dimorphic, the first focus of regression being at a low index both in Hottentots and Bushmen, a position in which the curves for other African races show no elevation.

The second focus corresponds to the commencement of the rise in the curve among the Kaffir and Negro tribes, and may perhaps be taken as an indication of some racial intermixture. This seems clear in the Hottentots, whose second focus more

nearly corresponds to the summit of the curve in the case of Negroes from the "Central Lakes"; in the Hottentots the curve continues with a gradual descent for some little distance. However, the abrupt cessation of this curve in the case of the Bushmen throws considerable doubt on this interpretation, and would indicate that such racial intermixture, if it occurred at all, must have been at an early period. Although male and female indices are tabulated together in this seriation, the dimorphism of the curve is due to racial, and not sexual, influences.

This index almost completely destroys the comparison drawn by Williamson between the Bushman and Ashanti crania, the former inclining towards tapeinocephalism, while the latter are very akrocephalic.

The seriation of the *alveolar* indices is of greater interest. The curve constructed from Bush crania is dimorphic, with maxima at 97 and 102, while that for Hottentots is monomorphic, with a maximum at 102. The first focus of regression in the curve for Bushmen is at a lower index than appears among other African races, and agrees with the usual description of such skulls as orthognathous; the second focus corresponds with the maximum of the curve among the Negroes from the shores of Lake Nyassa, but it is less than the maximum for Negroes from the north-west coast. This curve indicates resemblances between the Bushmen and other pigmy races, the first maximum corresponding to the mean alveolar index of the European pigmies, while the second approaches that of the Negrillos of the Central African forests. The greater prognathism of the Hottentots separates them from the Kaffir tribes in contact with them to the south-east, and constitutes a point of resemblance with the Negroes of the lake districts.

That such a relationship should exist is very probable, as the loose stone heaps which mark the track of the Hottentots are to be found far to the north of the Zambesi river, and Andersson describes wandering tribes of Bushmen in the extreme north of Damaraland, where they must for a long time have been close neighbours of the central group of Bantu-speaking peoples. Some of the skulls from tribes inhabiting the western shores of Lake Nyassa are almost indistinguishable from those of Hottentots from Cape Colony. There are a number of races inhabiting a strip of country extending from the great lakes to the Zambesi distinguished by prognathous and hypsistenedolichocephalic skulls. These races are separated from the sea on the one side by the Makua, Mozambique, and Kaffir tribes, who are tapeinocephalic and less prognathous, although pre-

senting the same degree of dolichocephalism, and on the other by Ova Herrero and Bangala tribes, of whose craniological features, which appear to resemble those of the Kaffirs of Natal, we know but little.

The seriation of the *orbital* index separates off the Bush as the only markedly microseme African race, and shows that it is most nearly approached in this respect by the Negroes of the Slave Coast.

The dimorphism of this curve is due to sexual influences, the female skulls being more megaseme than the male.

The curve of the *nasal* index is monomorphic, the maximum being at 62 in the Bushmen, while in the Hottentots there is a tendency to group round 53, an index which corresponds with the maximum for tribes from the lake districts. The Bush races are thus seen to be the most platyrrhine in Africa, but to be approached in this respect, as Williamson has pointed out, by the Ashantis.

The Bushmen of South Africa therefore appear to be characterised by certain specific features, and not to very closely resemble any other race.

The first theory as to their origin was that propounded by Barrow in his "Travels in Southern Africa," published in 1801. He considers that the Bush races might have arisen as the offspring of Chinese sailors wrecked on the Mozambique coast. To support this hypothesis he notices certain resemblances between the Bushmen and Mongolians, and observes that the upper lid of the eye of a real Hottentot, as in that of the Chinese, was rounded off into the lower on the side next the nose. In his "Travels in China" Barrow goes on to remark: "Further observations have confirmed me in the striking degree of resemblance between them. Their physical features agree in almost every point: the form of their persons, the smallness of their joints and extremities, their colour and features, their voices, and particularly their singularly shaped eye." Barrow, it should be observed, does not distinguish between Hottentots and Bushmen, describing these nomad peoples as "true aborigines of South Africa, unmixed with any other tribe."

This view as to the Chinese origin of the Bushmen received support from Knox in 1824, and in later years from Lamprey, who, after pointing out some slight resemblances between Chinese and Hottentot skulls in his possession, continued his comparison on ethnological grounds.

This hypothesis was without difficulty refuted by Desmoulins, as in their general features these races present no resemblances.

It is, however, worthy of note that Williamson in his description of the Bush crania at Chatham, while disclaiming

all views as to their Chinese affinities, compares them with Malays.

A more useful comparison is with the Negrillos of the equatorial forest zone in Africa and with the pigmy races recently described in Europe.

Sir William Flower in his memoir on the Akkas shows many points of resemblance between them and the Bushmen, and notes that their skulls conform more to the type of the African Negro than to that of any other race.

Prognathism, platyrrhiny, elongated, narrow palate, and large teeth, all characteristic of the Negro, are exaggerated in the Akka. The last three characters are also found in the skulls of Bushmen, while the extremes of prognathism recorded for the latter exceed those found in the Akkas, although their mean alveolar index is considerably the smaller. A special feature of the Akka skull is the microseme orbit, which is also characteristic of Bushmen.

The oblong oval skull, the vertical forehead, and well-marked supra-mastoid grooves are equally noticeable in both races.

Descriptions of the appearance of the Negrillos vary somewhat, but Hermann von Wissmann in the narrative of his second journey through Equatorial Africa describes the Batwa of the forest zone south of the Congo, who are probably of the same race as the Akka, as reminding him strongly of portraits of the Bushmen of Cape Colony. Du Chaillu describes a pigmy race, the Obongo, in Ashiraland, as of a light brown colour, and somewhat resembling the Bushmen.

On the whole it seems probable that the Negrillos and the Bushmen are allied, the former either having taken refuge in the almost impenetrable forest when the onrush of the conquering Bantu Kaffirs swept the Bushmen to the south, or else having penetrated therein before this invasion, and so being unaffected by it. The principal objection to such a view is that the phenomenon of steatopygia has as yet not been described among the Negrillo races. Dr. Junker indeed definitely states that among the Wochua this feature is never found.

The comparison of the Bushmen and the European pigmies is rendered the more interesting on account of the statuette from the neolithic station at Brassempouy which represents the race of that time as steatopygous.

In Europe remains of a pigmy race have been found in neolithic strata at Schaafhausen, and in Sicily and Sardinia a small race still surviving was discovered by Professors Kollmann and Sergi. Professor Sergi considers that the pigmy races came to Europe in neolithic times, but that they present no Negrito affinities.

On examining together the skulls of Bushmen and of a European pigmy, a few interesting points of comparison may, however, be noticed. The European skulls are rather smaller. The cranial capacity of a skull from Schaafhausen described by Professor Kollmann is 1207 c.c., while that of a Sicilian pigmy in the Vesalianum at Basle is 1030 c.c., the average capacity of Bush crania being 1330 c.c. If a well-filled Bushman skull be selected for comparison the cranial outline as seen in *norma verticalis* is similar in the two cases. The zygomatic arches are, however, relatively wider in the European pigmy skull, which is phaenozygous, while in the Bush crania the cryptozygous condition usually obtains.

Viewed in *norma lateralis*, well-marked double lineæ temporales, a small mastoid, strong zygomatic arch, and post-zygomatic ridge with a slight supra-mastoid groove, are to be noticed in the skull of the Sicilian pigmy, as in that of the Bushman. These features, it may be remarked, are not found among the Andamanese or the Negritos of Malaysia. In the pigmy the forehead is full and vertical, the nasal bones are inconspicuous in profile, and the face is superiorly orthognathous, all of these features being also characteristic of the Bush races of South Africa.

In *norma facialis* there are also several points of resemblance, such as the wide interorbital space, the prominent, forwardly projecting malars, the deep infra-orbital fossæ, the marked platyrrhiny, and chamæprosope nature of the face.

The nose in the Sicilian pigmy is the most platyrrhine in Europe, but differs from that of the Bushmen and the negroid races generally in the greater prominence of the bridge and the sharper chiselling of the lower border and floor, although the general shape of the apertura pyriformis is not very dissimilar in the two cases.

The cephalic, facial, orbital, and nasal indices of the two races agree very well; but the European pigmy is sharply distinguished from his African brother by the possession of a very akrocephalic skull, a feature never found among the Bushmen.

For the present I can only say that the data seem to me too insufficient to enable the affinities of the various pigmy races to be clearly demonstrated or to allow of much significance being attached to any apparent resemblances.

TABLE OF SERIATIONS.

LENGTH-BREADTH INDEX.

	Bushmen.	Hottentots.	Kaffirs.	Central Lake District Negroes.	North-west Coast Negroes.
64	—	—	—	—	2
65	—	—	—	—	1
66	—	1	1	—	—
67	2	—	—	2	1
68	1	1	3	2	3
69	2	1	3	5	8
70	1	2	3	8	9
71	1	2	4	11	10
72	2	4	4	5	8
73	6	5	2	4	16
74	8	1	8	6	11
75	10	3	2	4	14
76	11	7	4	1	10
77	6	2	—	3	7
78	9	—	2	1	9
79	2	1	—	2	4
80	2	—	—	1	3
81	1	—	—	—	1
82	—	—	—	—	1
83	—	—	—	—	1
84	—	—	—	—	—
85	—	—	—	—	—
86	—	—	—	—	1

TABLE OF SERIATIONS.

LENGTH-HEIGHT INDEX.

	Bushmen.	Hottentots.	Kaffirs.	Negroes of Central Lake District.	Negroes of North-west Coast.
65	2	1	—	—	1
66	—	—	1	—	—
67	4	2	1	1	2
68	2	—	—	5	5
69	5	4	1	4	4
70	13	13	4	6	6
71	7	3	2	5	4
72	7	6	6	1	7
73	7	4	5	10	12
74	5	1	2	7	17
75	2	1	7	4	12
76	3	2	2	3	14
77	—	—	—	2	9
78	2	—	2	1	11
79	—	—	—	2	11
80	—	—	3	—	6
81	—	—	—	1	3

TABLE OF SERIATIONS.

BREADTH-HIGHT INDEX.

	Bushmen.	Hottentots.	Kaffirs.	Negroes of Central Lake District.	Negroes of North-west Coast.
86	—	—	—	—	1
87	—	1	—	—	—
88	1	—	—	—	—
89	1	2	—	—	—
90	2	3	—	—	1
91	5	—	—	—	—
92	7	3	—	2	2
93	1	2	—	2	1
94	2	1	1	1	1
95	3	—	—	—	1
96	7	4	3	3	2
97	1	1	1	1	2
98	3	1	6	4	2
99	1	2	—	4	4
100	1	4	1	6	6
101	2	2	3	3	2
102	—	—	1	5	3
103	—	1	1	4	5
104	—	1	3	2	1
105	—	1	1	2	2
106	—	2	2	4	2
107	—	1	—	2	1
108	—	—	—	1	3
109	—	—	—	—	—
110	—	—	1	—	—
113	—	—	—	—	1
116	—	—	—	1	—

TABLE OF SERIATIONS.

ALVEOLAR INDEX.

	Bushmen.	Hottentots.	Kaffirs.	Negroes of Central Lake District.	Negroes of North-west Coast.
88	—	1	—	—	—
89	—	—	—	—	—
90	—	—	—	—	—
91	1	—	—	—	—
92	—	1	—	—	—
93	2	—	1	—	1
94	1	—	—	2	—
95	2	—	2	1	1
96	2	1	—	—	1
97	6	—	2	1	1
98	3	2	5	4	2
99	2	3	1	5	3
100	3	1	2	1	4
101	1	3	1	5	5
102	9	4	1	6	2
103	1	1	1	7	5
104	2	1	3	3	9
105	—	2	1	5	5
106	1	2	4	3	4
107	1	2	1	2	3
108	—	—	—	2	2
109	—	—	—	—	1
110	—	1	—	—	—
111	—	—	—	—	—
112	—	—	—	—	1

TABLE OF SERIATIONS.

ORBITAL INDEX.

	Bushmen.	Hottentots.	Kaffirs.	Negroes of Central Lake District.	Negroes of North-west Coast.
66	3	—	—	—	—
72	—	1	—	—	—
74	1	—	—	—	1
75	2	1	1	—	1
76	6	3	—	1	1
77	—	—	—	1	—
78	1	—	—	—	—
79	2	5	1	2	1
80	1	—	—	—	3
81	3	2	—	1	2
82	5	1	3	2	5
83	2	1	1	1	1
84	5	1	1	4	4
85	5	2	3	3	5
86	7	4	3	2	4
87	2	1	5	6	8
88	1	—	—	1	1
89	4	3	3	7	2
90	1	1	—	3	3
91	2	—	—	—	1
92	2	3	3	4	8
93	—	—	—	—	—
94	4	—	1	8	1
95	1	—	1	—	1
96	—	—	—	—	1
97	—	5	—	3	1
98	—	—	—	—	1
99	—	—	—	—	—
100	1	1	—	1	1
108	—	1	—	—	—

TABLE OF SERIATIONS.

NASAL INDEX.

	Bushmen.	Hottentots.	Kaffirs.	Negroes of Central Lake District.	Negroes of North-west Coast.
47	—	—	—	—	1
48	1	—	—	—	2
49	1	1	1	1	2
50	1	—	2	1	1
51	1	3	1	2	4
52	2	—	—	4	3
53	3	3	1	5	1
54	3	2	4	4	6
55	1	—	—	6	5
56	2	3	4	4	4
57	—	—	1	6	7
58	2	2	—	1	—
59	2	—	1	4	2
60	5	2	4	1	5
61	2	2	—	4	—
62	6	2	2	4	7
63	1	1	—	—	1
64	—	—	—	1	1
65	—	1	—	2	1
66	3	1	1	—	—
67	1	1	1	—	1
68	—	—	—	—	—
69	1	—	1	—	1
70	1	—	—	3	—
71	—	—	—	—	—
72	—	—	—	1	1
73	—	—	—	—	—
74	1	—	—	—	—

References.

- Barrow* i. "Travels in Southern Africa."
 ii. "Travels in China."
Sir William Flower .. Akkas. "Journ. Anthropol. Inst.," vol. xviii.
Gustav Fritsch i. "Die Eingeborenen Süd. Afrikas." Breslau,
 1872.
 ii. "Die Afrikanischen Buschmänner als Krasse
 Zeitschr. für Ethnologie." Bd. xii. 1880.
Galton "Narrative of an Explorer in Tropical South Africa."
Sir H. H. Johnston .. "Livingstone and the Exploration of Central Africa."
Junker "Travels in Central Africa," vol. iii.
de Quatrefages and
Hamy "Crania Ethnica."
Rolleston "Bushman Crania," in "Collected Scientific Papers
 and Addresses," p. 462.
Sir William Turner .. "Report on the Human Crania of the 'Challenger'
 Expedition."
Williamson "Observations on the Human Crania in the Army
 Medical Museum," in "Dublin Quarterly Journal
 of Medical Sciences." 1857.
Wissmann "Through Equatorial Africa."

Description of Plate XVI.

- Fig. 1.—*Norma facialis* of adult male Bushman.
 „ 2.—*Norma lateralis* of the same.
 „ 3.—*Norma facialis* of adult male "True" Hottentot.
 „ 4.—*Norma lateralis* of the same without lower jaw.

The photographs are of skulls in the Army Medical Museum at Netley Hospital.

P.S.—Since the above was written I have been enabled by the kind permission of the authorities to examine the collection of Bush and Hottentot crania in the Army Medical Museum at Netley. These skulls differ in no important respects from those previously described. A table of their measurements and indices is appended, but they have not been included in the averages and seriations.



1.



2.



3.



4.

TABLE OF MEASUREMENTS AND INDICES OF CRANIA IN

HOTTENTOTS

Number	1	2	3	4	5
Catalogue number	App. 48	App. 49	408	409	410
Sex	♂	♂	♂	♂	♂
Maximum glabello-occipital length	182	188	185	178	176
Maximum breadth	136	130	139	135	134
Basi-bregmatic height	117	135	134	131	128
Minimum frontal breadth	95	96	88	106	97
Maximum frontal breadth	112	111	115	123	110
Bi-stephanic breadth	112	101	97	110	110
Pterion breadth	107	110	101	113	100
Asterion breadth	102	109	103	109	110
Basi-nasal length	97	105	100	97	99
Basi-alveolar length	98	105	100	96	93
Foramen magnum length	31·5	40	34	36	37
Foramen magnum breadth	25	30	28	32	28
External bi-orbital breadth	105	110	100	116	107
Internal bi-orbital breadth	99	—	94	104	100
Bi-jugal breadth	118	—	110	117	109
Bi-maxillary breadth	—	—	90	105	91
Bi-zygomatic breadth	126	—	123	130	118
Post-malar breadth	—	—	120	128	113
Ophryo-alveolar height	92	100	92	85	78
Naso-alveolar height	72	72	70	64	57
Spino-alveolar height	27	23	—	20	17
Ophryo-mental height	—	—	141	—	117
Naso-mental height	—	—	118	—	98
Orbital breadth	37	40	37	38	38
Orbital height	34	36	30	30	27
Bi-dacryc breadth	21	20	18	27	23
Nasal height	45	52	—	45	48
Nasal breadth	23	27	—	31	24
External palatine length	57	58	53	55	51
Internal palatine length	53	50	49	51	48
External palatine breadth	60	64	64	64	59
Internal palatine breadth	35	37	42	41	37
Anterior palatine breadth	41	43	45	43	40
Dental length	42	—	40	—	41
Naso-malar curve	109	—	99	112	110
Sub-cerebral curve	22	29	23	31	21
Total frontal curve	128	127	119	122	127
Parietal curve	119	124	135	130	126
Supra-occipital curve	60	72	69	59	61
Total occipital curve	109	118	118	108	100
Total sagittal curve	356	369	372	360	353
Supra-auricular curve	292	302	298	295	289
Total transverse curve	430	449	433	424	415
Pre-auricular curve	245	244	235	222	232
Total horizontal curve	504	508	513	497	494

INDICES.

Length-breadth	74·7	69·1	75·1	75·8	76·1
Length-height	64·3	71·8	72·4	73·6	72·7
Breadth-height	86	96·2	96·4	97	95·5
Upper facial (Kollmann)	57·1	—	56·9	49·2	48·3
Upper facial (Broca)	73	—	74·8	65·4	66·1
Total facial (Kollmann)	—	—	95·9	—	83·1
Total facial (Broca)	—	—	114·6	—	99·2
Maxillary facial	—	—	77·8	61	62·6
Orbital	91·9	90	81·1	78·9	71·1
Nasal	51·1	51·9	—	68·9	60
Palatal (staphylinic)	66	74	85·7	80·4	77·1
Palatal (uranic)	105·3	110·3	120·8	116·4	115·7
Alveolar	101	100	100	99	100
Dental	43·3	—	40	—	41·4
Naso-malar	110·1	—	105·3	107·7	110
Fronto-zygomatic	88·9	—	93·5	94·6	93·2
Stephanio-zygomatic	88·9	—	78·8	84·6	93·2
Relations of Diameters { Minimum frontal breadth-maximum breadth	69·9	73·8	63·3	78·5	72·4
Bi-stephanic breadth-maximum breadth	82·4	77·7	69·8	81·5	82·1
Pterion breadth-maximum breadth	78·7	84·6	72·7	83·7	74·6
Asterion breadth-maximum breadth	75	83·8	74·1	80·7	82·1
Sub-cerebral-total frontal	17·2	22·8	19·3	17·2	16·5
Frontal-total sagittal	36	34·4	32	33·9	36
Parietal-total sagittal	33·4	33·6	36·3	36·1	35·7
Relations of Curves { Occipital-total sagittal	30·6	32	31·7	30	28·3
Pre-auricular-total horizontal	48·6	48	45·8	44·7	47
Supra-auricular-total transverse	67·9	67·3	68·8	69·6	69·6

IA IN THE ARMY MEDICAL MUSEUM AT NETLEY HOSPITAL.

TOTS.				BUSHMEN.							
5	6	7	8	9	10	11	12	13	14	15	16
410	411	412	413	418	419	420	421	422	424	426	427
♂	♂	♂	♂	♂	♂	♂	♂	♂	♂	♂	♂
176	183	182	174	178	173	173	172	184	174	189	174
134	127	135	131	134	135	135	136	130	139	136	126
128	134	132	130	123	121	118	130	130	133	123	122
97	88	102	95	95	94	91	91	96	92	93	95
110	106	112	117	114	114	117	—	116	114	110	106
110	96	112	111	106	112	100	—	114	112	108	106
100	101	100	107	103	103	97	102	104	93	105	102
110	102	—	110	117	103	107	109	99	104	—	95
99	101	97	92	96	87	91	98	93	90	97	89
93	102	99	91	98	91	94	95	91	88	—	—
37	37	35	33	37	36	34	34	37	39	—	33
28	27	26	26	31	28	26	33	26	30	—	25
107	101	110	103	103	101	102	103	97	—	—	—
100	97	104	97	95	97	96	95	88	—	—	—
109	112	118·5	113	112	111	108	106·5	101	—	—	—
91	91	97	94	89	—	87	84	86	—	—	—
118	117	131	123	122	—	118	—	111	—	—	—
113	116	130	120	121	—	116	—	108	—	—	—
78	93	91	84	83	81	79	77	74	69	—	—
57	71	65	65	57	58	61	59	59	55	—	—
17	26	20	23	18	20	21	22	19	19	—	—
117	—	—	—	—	—	—	—	—	—	—	—
98	—	—	—	—	—	—	—	—	—	—	—
38	38	38	35	36	39	37	38	34	36	—	—
27	36	33	33	27	31	31	32	33	33	—	—
23	22·5	27	26	19	20	20	22	18	21	23	—
48	45	45	43	41	41	40	38	42	37	41	—
24	28	27	27	28	25	24	25	23	25	24	—
51	57	52	51	54	52	52	48	47	44	—	—
48	50	47	45	49	48	46	45	41	40	—	—
37	34	38	42	36	40	34	32	32	31	—	—
40	40	—	41	39	—	36	37	43	40	—	—
41	43	—	—	40	—	44	—	—	—	—	—
110	104	112	103	101	101	100	99	95	—	—	—
21	22	28	19	27	22	20	17	15	15	27	—
127	124	131	126	130	129	120	120	134	126	131	—
126	125	128	122	118	112	111	121	123	127	115	119
61	60	65	68	61	74	60	58	71	60	71	—
100	110	113	111	114	120	114	114	113	111	110	121
353	359	372	359	362	361	345	355	370	364	356	—
289	288	—	295	292	290	270	—	302	304	—	—
415	415	—	435	425	410	403	—	427	412	—	—
232	210	—	235	238	232	228	—	249	210	—	—
494	498	—	499	505	500	491	—	506	485	—	—
76·1	69·4	74·2	75·3	73·5	78	78	79·1	70·7	79·9	75·6	72·4
72·7	73·2	72·5	74·7	71·9	69·9	68·2	75·6	70·7	76·4	68·3	70·1
95·5	105·5	97·8	99·2	95·5	89·6	87·4	95·6	100	95·7	90·4	96·8
48·3	60·7	49·6	52·8	46·7	—	51·7	—	53·2	—	—	—
66·1	79·5	69·5	68·3	68	—	66·9	—	66·7	—	—	—
83·1	—	—	—	—	—	—	—	—	—	—	—
99·2	—	—	—	—	—	—	—	—	—	—	—
62·6	78·7	67	69·1	64	—	70·1	70·2	68·6	—	—	—
71·1	94·7	86·8	94·3	75	79·5	83·8	84·2	97·1	91·7	—	—
60	62·2	60	62·8	68·3	61	60	65·8	54·8	67·6	58·5	—
77·1	68	80·9	93·3	73·5	83·3	73·9	71·1	78	77·5	—	—
115·7	103·5	119·2	121·6	116·7	—	107·7	116·7	129·8	122·7	—	—
100	101	102·1	98·9	102·1	104·6	103·3	96·9	97·8	97·8	—	—
41·4	42·6	—	—	41·7	—	48	—	—	—	—	—
110	107·2	197·7	106·4	106·3	104·1	104·2	104·2	108	—	—	—
93·2	90·6	85·5	95·1	93·4	—	99·2	—	104·5	—	—	—
93·2	82·1	85·5	90·2	86·9	—	84·7	—	102·7	—	—	—
72·4	69·3	75·6	72·5	70·9	69·6	67·4	66·9	73·8	66·2	72·1	75·4
82·1	75·6	83	84·7	79·1	83	74·1	—	87·7	80·6	79·4	84·1
74·6	79·5	74·1	81·7	76·9	76·3	71·9	75	80	66·9	77·2	81
82·1	80·3	—	84	87·3	76·3	79·3	80·1	76·2	74·8	—	75·4
16·5	17·7	21·4	15·1	20·8	17·1	16·7	14·2	11·2	11·9	20·6	—
36	34·5	35·2	35·1	35·9	35·7	34·8	33·8	36·2	34·6	36·8	—
35·7	34·8	34·4	34	32·6	31	32·2	34·1	33·2	34·9	32·3	—
28·3	30·6	30·4	30·9	31·5	33·2	33	32·1	30·5	30·5	30·9	—
47	42·2	—	47·1	47·1	46·4	46·4	—	49·2	43·3	—	—
69·6	69·4	—	67·8	68·7	70·7	67	—	70·7	73·8	—	—

MEASUREMENTS OF MANDIBLE IN MILLIMETRES.

Museum		BUSHMEN.													
		Cambridge.						Royal College of Surgeons.							
		1751	1738	1743	{ 24 7	23 —	1301	1300	1302	1303	1303B	1303K	1304	1625	1623
Catalogue Number		..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bi-condyloid breadth	..	124	119	102	112	111	107	107.5	104	119	102	100	107	—	108
Bi-gonial breadth	..	111	92	89	74	82	90	84	84	96	85	94	81	86	92
Bi-mental breadth	..	42	21	24	34	24	27	26	23	29	37	22	34	26	—
Symphysial height	..	38	30.5	28	29	35	29.5	28.2	28	—	27	33	29	34	—
Malar height	..	29	27	24	24	22	20	27.2	22	26	24	22	24	—	26
Height of ascending ramus	..	47	50	33	37	43	37	38	36	40	35	36	29.5	34	40
Breadth of ascending ramus	..	35	33	34	30	36	32	33	35	39.5	29	33	34	30	30
Bi-gonio-symphysial curve	..	211	191?	180	190	192	175	171	162	188	178	174	173	150	191
Gonio-symphysial chord	..	90	88	77	—	—	81	73	74	88	84	81	81	72	89
Condyle-coronoid chord	..	42	33	29	—	—	37	36	32	44	33	34	36	37	41
Bi-zygomatic breadth	..	—	127	120	116	120	112	120	111	133	116	117	118	117	123
Gonio-zygomatic index	..	—	72.4	74.2	63.8	68.3	80.4	70	75.7	72.2	73.3	80.3	68.6	73.5	74.8

MEASUREMENTS OF MANDIBLE IN MILLIMETRES.

HOTTENTOTS.												
Museum	Catalogue Number	Cambridge.		British Museum.	Royal College of Surgeons.							
		1739	1747	84, 4, 9, 1	1296	1298A	1618	1619				
Bi-condyloid breadth	..	110	110	110.5	120	100	93	105				
Bi-gonial breadth	88	102	71.5	108	84	83	90				
Bi-mental breadth	20	47	—	43	23	—	32				
Symphysial height	36	32.5	32	37	31	31	27				
Molar height	26.5	26	23	33	23	25	22.5				
Height of ascending ramus	36.5	50	36	48	36	42	37				
Breadth of ascending ramus	35	34	33	46	32	30	38				
Bi-gonio-symphysial curve	196	198	184	195	173	155	188				
Gonio-symphysial chord	97	93	84	101.5	83	75	88				
Condylo-coronoid chord	36.5	34	34	40	32	33	40				
Bi-zygomatic breadth	124.5	131	118.5	137	117	109	—				
Gonio-zygomatic index	70.7	77.9	60.5	78.8	71.8	76.1	—				

The CARIB LANGUAGE as now spoken in DOMINICA, WEST INDIES. By JOSEPH NUMA RAT, St. Kitts, West Indies, February, 1897.

ORTHOGRAPHY.

FIVE of the vowel sounds used in these illustrations of the Carib language are those of the Italian, viz., *a, e, i, o, u*. A sixth is that of a short *ũ* and corresponds to the vowel as it is pronounced in the French word *vu*; e.g., *sũsũ* = a bird. A seventh is the short *ĩ* pronounced as in the English *sin* and found in such words as *ĩatina* = I am, in which the second *i* is so lightly sounded that the third syllable may be omitted in conversation and the verb become *iatna*.

Whenever two or more vowels are in contact each is pronounced separately.

The consonants have more or less the same sounds as in English. They are the same in number as in that language with the exception of the soft *c, j, x, and z*, which are not employed in Carib, and *d*, which is probably replaced by *t*.

The compound consonants are *nh* and *ch*. The former occurs in *nha*, which is the third person plural of the personal pronoun. The *n* is pronounced, as far as it can be, before the *h* which is aspirated. The latter, when at the beginning of a word, is sounded as in the English *church*; and, when final, as in the Scotch *loch*.

The letter *h* is always aspirated.

The accent in the Carib words will be indicated by placing the French acute accent over the vowel on which it falls; e.g., in *mĩtu*, the accent should be placed on the penultimate, and, in *hĩruti*, on the antepenultimate syllable.

As a rule to which I remember no exception, the accent in words of two syllables is placed on the penultimate, and, in those of three or more syllables, on the antepenultimate syllable.

THE ARTICLE.

The indefinite.

The indefinite article is expressed, as it is in many other languages, by the word meaning one, viz., *aba*; *aba mĩtu* = a person; *aba yĩmati* = a basket. The word *aba* is sometimes omitted in phrases in which the indefinite article is expected in

English; thus, *aparánuba buírühü, napúroku wátu nakútahani* = if I kill a wild pig, I light a fire to roast it; *átuka kréeti mátu aba báti* = when a person wants to build a house. *Buírühü* = wild pig; *wátu* = fire; *mátu* = person.

The definite.

There is no definite article in Carib. This is shown by the following sentences, *barunúmuti áрма arábsen* = I took the road through the forest (*barunúmuti* = I took, *áрма* = road, *arábsen* = through the forest); *súlútna túna akáiruku* = I reached the bank of the river (*súlútna* = I reached, *túna* = river, *akáiruku* = bank).

The place of the definite article is supplied by the third person of the personal pronoun and by the demonstrative pronoun, e.g., *lákusa síbui* = the gommier tree (*síbui* = gommier, *ákusa* = tree, *l*, short for *li*, = the third person singular of the personal pronoun); *lákusa líha síbui* = the tree of the gommier (*líha* = a demonstrative pronoun); *aba wúkúri* = a boy, *ábana líha wúkúri* = one of the boys; *harátium nhílewe* = the flowers are white (*harátium* = white, *ílewe* = flowers, *nh*, short for *nha*, = the third person plural of the personal pronoun).

THE SUBSTANTIVE.

The subject of a sentence may either precede or follow the verb; *níbáya su han awáita* = all my children are grown up (*níbáya* = my children, *su* = all); *yanhi nhapúkasa su nábaya* = all my children were born there.

There is no declension in the Carib language. The possessive noun generally precedes the others; thus, *túna akáiruku* = the bank of the river; *kíere ákusa* = pieces of manioc (*túna* = river, *kíere* = manioc). It may, however, follow; e.g., *lúbuye líha baranáki* = the house of the white man (*lúbuye* = the house, *líha* = the, *baranáki* = white man); *lúbuye aba mátu* = the house of a person. The relation between the nouns in such instances can only be gathered from their meaning.

Dependence on a verb when direct is expressed by placing the dependent noun immediately after the verb; when indirect, by inserting the personal pronoun of the third person between the verb and the noun. *Wa suáha wáiriti wéwe* = we cut down the large trees (*wa* = we, *suáha* = cut down, *wáiriti* = large, *wéwe* trees). *Rubái uíhi líni áuli* = give the meat to the dog (*Rubái* = give, *uíhi* = meat, *líni* = to him (the), *áuli* = dog).

Instrumentality is indicated by the preposition *áo* = with; *láo akáiruku* = with creepers; *láo musiére* = with leaves; motion from, by *oária* = from; *loária báti* = from the house.

When placed before a noun, such prepositions as *do*, *oária*, etc., have always prefixed to them the third person of the personal pronoun, viz., *l* or *t*, short for *li* or *ti*, according as the noun is masculine or feminine.

NUMBER.

The plural has generally the same termination as the singular. This is doubtless due to the want of education as well as to the indolence of those by whom the Carib language is now spoken, the context being left to indicate the number of the noun.

When a Carib is sufficiently pressed to make a distinction between the two numbers, it is found that this is effected by adding *em* or *iem* to some, and *um* or *ium* to other nouns.

GENDER.

The letters *l* and *t* prefixed to substantives indicate the masculine and feminine genders respectively. It should, however, be remembered that *l* and *t* are short for *li* and *ti*, the masculine and feminine of the third person of the personal pronoun which serve the purposes of the definite article and the possessive pronoun. In such expressions, therefore, as *lóaku lisibu* = over his face, and *tóaku tisibu* = over her face, the literal translation should be, over the face of him or over him, his face, and over the face of her or over her, her face.

Hence Carib substantives may be grouped in two classes, the *l* class and the *t* class; and, as the former include all male, and the latter, all female beings, the substantives of these two groups may be described as masculine and feminine respectively with as much propriety in Carib as in any other language.

A few substantives, like *áuli* = dog, being common to both sexes, may also be correctly described as being of a common gender. In such cases the sex is indicated by placing the word *wáikuri* = male, or *wári* = female, before the substantive.

The majority of the substantives of the *l* or masculine class end in *i* or *e*; and the majority of those of the *t* or feminine class in *o* or *u*.

ADJECTIVES.

Adjectives, when in direct contact with the substantives which they qualify, always precede the latter; *wáiriti wéwe* = large trees (*wéwe* = trees); *kíbe weyu* = many days (*wéyu* = days).

When the modern Carib takes the trouble of expressing the plural of an adjective, he does so by adding to the singular the same termination as in the case of the substantive.

Degrees of comparison are indicated by means of such suffixes as *oária, lati, kasi, sikákua láo, lábu*, etc.

The first of these is used in conjunction with personal pronouns in the following way :—

		1st.		2nd.		3rd.
Singular	..	<i>Noária</i>		<i>Boária</i>		<i>Loária.</i>
		(More than I.)		(More than thou.)		(More than he.)
Plural	..	<i>Waoária</i>		<i>Hoária</i>		<i>Nhoária.</i>
		(More than we.)		(More than ye.)		(More than they.)

The subjoined sentences illustrate the use of the above suffixes :—

Wairítña loária líra = I am taller than he.

Líha wáiriti noária = He is taller than I.

Mawairikitiwa hílati = We are not as big as you.

Wáiriti líha mésu kasi líha áuli = The cat is as big as the dog.

Hanuhutétña héve sikákua láo buirákú arasáni = I fear a tête de chien (name of a snake) more than a wild pig.

Líha bímeti lábu líkuya = This one is less sweet than that one (*ábu* = under or beneath).

The superlative, when used absolutely, is expressed either by repeating the adjective, e.g., *wíri wíri* = very black, *haru haru* = very white, or by lengthening the vowel of the first syllable, thus *wíiiri*, *haaarú*. When employed relatively, it is formed as in French, by placing *líha* = the, before the comparative.

PRONOUNS.

Personal.

There are two forms of the personal pronoun, viz., the absolute and the conjunctive.

The absolute.

		1st.		2nd.		3rd.
Singular	{	<i>Núkuya</i>		<i>Búkuya</i>		{ <i>Líkuya</i> (masc.)
		or <i>Áo</i>		or <i>Ámoro</i>		{ <i>Túkuya</i> (fem.)
Plural	..	<i>Wákuya</i>		<i>Húkuya</i>		<i>Nhákuya.</i>

Káta mítu yánhi = Who is there?

Áo = It is I; *Ámoro* = It is thou; *Wákuya* = It is we.

Though generally reserved for the absolute form of the pronoun, the above may be used in conjunction with verbs in cases in which emphasis is required, *e.g.*,

Áo ba búma = I go with thee.

Ámoro ba núma = Thou goest with me.

Líkuya atúkáyali = He did it.

Áo and *ámoro* are used by men, and *núkuya* and *búkuya* by women. The other persons are used by both sexes.

The Conjunctive.

		1st.		2nd.		3rd.
Singular	..	<i>Ni</i>		<i>Bu</i>		<i>Li</i> (masc.) or <i>Ti</i> (fem.).
Plural	..	<i>Wa</i>		<i>Ha</i>		<i>Nha</i> .

Biabri wéyu láusen ni síruni = It is four days since I left.

Nha bunáhai lubuyékua = They buried him in his own house.

When the verb begins with a vowel, the terminal vowel of the pronoun is dropped; *átúka* = to make; *natúkaya* = I am making; *abúaha* = to cook; *tabuáhaya aíkini* = she cooks my food.

The relations of the personal pronouns to other words are indicated by such suffixes as *úni*, *úma*, *óroman*, *óaku*, *óaria*, etc., added to the pronominal consonants *n*, *b*, *l* or *t*, *h*, *nh*, and to *wa*, the first person plural:—

		1st.		2nd.		3rd.
Singular	..	<i>Núni</i>		<i>Búni</i>		<i>Lúni</i> or <i>Túni</i> .
Plural	..	<i>Wáuni</i>		<i>Húni</i>		<i>Nhúni</i> .

Róbai núni = Give it to me.

Ni síkuba líha búni lo béheru bárunu núni = I give you this to buy plantains for me.

Chiséntina búni = I love you.

Káriti nári núni = I have toothache (literally, my tooth is painful to me).

Nibisikaétina boária = I am ashamed of you.

Akuiméhati túma = He is making love to her.

The forms in *úni* are used when the pronouns are in the

dative case or when they are indirectly dependent on verbs. When they are directly governed by verbs or placed at the end of words, they are expressed as follows:—

		1st.		2nd.		3rd.
Singular	..	<i>Na..</i>	.. ..	<i>Bu or B ..</i>	{	(m.) <i>Li</i> or <i>I</i> . (f.) <i>Ru, Ti</i> or <i>Tu</i> .
Plural	..	<i>Wa</i>	.. ..	<i>Hũ..</i>	..	<i>Em</i> or <i>Um</i> .

Nutaínuba Kairabu, nahirubátibu = If I go to Roseau, I will see you.

Nha bunáhai makáiti = They buried him without a coffin (*bunáhai* = buried him).

Barihúbatina mamáruku = Thou wilt see me to-morrow.

Kátana = Who am I? *Kátahũ* = Who are ye?

Kua, in combination with a personal pronoun, corresponds to the English "self." It is affixed to that form of the pronoun which ends in *úni*.

		1st.		2nd.		3rd.
Singular	..	<i>Nuníkua ..</i>	..	<i>Buníkua ..</i>	..	<i>Luníkua.</i>
Plural	..	<i>Waníkua</i>	..	<i>Huníkua ..</i>	..	<i>Nhuníkua.</i>
				= I myself, thou thyself, etc.		

Aráméta = To hide (trans.).

Arametákua = To hide (intrans.), or to hide oneself.

Narametákua nuníkua = I am hiding myself.

The words *líha* (masc.), and *túha* (fem.), which are really demonstrative pronouns, meaning "this," are used to indicate "him," and "her"; *lóaku líha* = on top of him; *lóaku túha* = on top of her; *tiámati líha* = he is pretty; *tiámatu túha* = she is pretty.

POSSESSIVE.

Possessive pronouns are expressed by prefixing the personal pronouns or the letters which represent them to substantives; *nukúsiri* = my father; *nukúsuru* = my mother; *níani* = my wife; *nibáya* = my children.

Íri = name; *Úma* = mouth.

		1st.	2nd.	3rd.
Singular	..	<i>Níri</i> .. (My name.)	.. <i>Bíri</i> .. (Thy name.)	<i>Líri</i> or <i>Tíri</i> . (His or her name.)
Plural ..	..	<i>Wáiri</i> .. (Our name.)	.. <i>Húiri</i> .. (Your name.)	<i>Nháiri</i> (Their name.)
Singular	..	<i>Núma</i> .. (My mouth.)	.. <i>Búma</i> .. (Thy mouth.)	<i>Lúma</i> or <i>Túma</i> . (His or her mouth.)
Plural ..	..	<i>Wáuma</i> .. (Our mouths.)	.. <i>Húma</i> .. (Your mouths.)	<i>Nháma</i> . (Their mouths.)

There is no absolute form of the possessive, corresponding to the English "mine," "thine," etc. The answer to, *Kat'áuli kía?* Whose dog is this? is *Láuli kía* = It is his dog, the substantive *áuli* being required in the reply.

Other possessive pronouns are met with which are compounded of the personal pronoun and the affixes *lūkū* or *ékū*.

		1st.	2nd.	3rd.
Singular	..	<i>Níūkū</i> ..	.. <i>Bíūkū</i> ..	<i>Líūkū</i> or <i>Tíūkū</i> .
Plural ..	..	<i>Wáūkū</i> ..	.. <i>Híūkū</i> ..	<i>Nháūkū</i> .

Níūkū áuli = my dog; *Bíūkū áuli* = thy dog, etc.; *Níékū áuli* = my dog, etc.

The particle *kúa* is also found in combination with the possessive; thus, *lubuyé-kua* = his own house.

		1st.	2nd.	3rd.
Singular	..	<i>Nubuyékua</i> ..	.. <i>Butubuyékua</i> ..	<i>Lubuyékua</i> .
Plural ..	..	<i>Wabuyékua</i> ..	.. <i>Hubuyékua</i> ..	<i>Nhabuyékua</i> .

DEMONSTRATIVE.

The words *líha* and *túha* represent the demonstrative "this" in the masculine and feminine respectively; *líha wákūri* = this boy; *líha síbui* = this gommier-tree; *túha wuri* = this girl; *túha yámati* = this basket.

Líha is used generally, as in English, without respect to gender, in such phrases as, *Itati líha?* = What is this? *Itálie batúkábali líha?* = Why have you done this?

"That" is expressed by *líketa* (masc.) and *túketa* (fem.). *Ámuye* signifies "other," as in the phrases, *Hálie ámuye?* =

Where is the other? *Irúfuti líha, yáwati líha ámuve* = This one is good, the other is bad.

Líketa is used generally, irrespective of gender, in the same way as *líha, líha lúma líketa* = this and that.

RELATIVE.

The relative is not expressed. It is understood in such sentences as, *Líkuya atúkáyali* = It is he who did it; *líha mútu wa búnuhai* = the person whom we buried (*wa* = we).

INTERROGATIVE.

Káta is the only form of the interrogative pronoun.

Káta bu ? = Who are you ?

Káta mútu yáhi ? = What person is that there ?

Katúkuya ? = Who is it ?

Káte bíri ? = What is your name ?

Kátae ? = What is it ?

Káta ánuku buakúbali ? = What disease have you got ?

Káta ba nátúka ? = What am I going to do ?

It may, however, be replaced by *íta* in such phrases as—

Ítati ? = What is the matter ?

Íta bíá ? = What is the matter with thee ?

Ítalia bíri ? = What is your name ?

Ítati líha ? = What is this ?

But *íta* can also be used as an adverb.

Ítalia batúkábali líha ? = Why have you done this ?

Ítalia bíábri ? = When did you arrive ?

Ítaba lasiríbuta ? = When will he return ?

Ítabuka lasiríbuta ? = When did he return ?

NUMERALS.

There are only four cardinal numerals in modern Carib, viz.,

Ába = one.

Biaba = two.

Írua = three.

Bíabri = four.

The remaining numbers are expressed by using the words of the French patois of the country.

The ordinals are formed by prefixing *l* or *t*, according to the gender of the substantive, to the cardinals, and suffixing the particle *áni*.

Labánani or *tabánani* = the first.

Libiábani or *tibiábani* = the second.

Lirúani or *tirúani* = the third.

Libiabríani or *tibiabríani* = the fourth.

Abakúati, *biabakúati*, *iruakúati*, *biabrikúati*, etc. = once, twice, thrice, four times, etc.

One by one, two by two, etc. = *ába ába*, *biaba biaba*, etc.

Libiri = half.

Atri = How many?

Itákara = a little, some.

Búi = much or many (literally "full").

Also *wairiti* = plenty (literally "large").

Su = all.

Úa = not.

Úati útu = there is no fish.

Mátati báruru = there is no plantain.

(*m* when prefixed denotes "absence of").

THE VERBS.

The verb "to be" is *íá*, which is sounded as two syllables, the accent being on the first syllable. It is conjugated as follows—

	Present.	Imperfect.
Sing.	$\left\{ \begin{array}{l} \text{1st. } \textit{Nia} \text{ ..} \\ \text{2nd. } \textit{Bia} \text{ ..} \\ \text{3rd. } \textit{Lia} \text{ (m.)} \\ \text{or } \textit{Tia} \text{ (f.)} \end{array} \right\}$ or $\left\{ \begin{array}{l} \text{1st. } \textit{Iátina} \text{ ..} \\ \text{2nd. } \textit{Iátibu} \text{ ..} \\ \text{3rd. } \textit{Iáli} \text{ (m.) or } \textit{Iáli} \text{ (f.)} \end{array} \right\}$	$\left\{ \begin{array}{l} \textit{Niábuka} \text{ or } \textit{Iatinábuka.} \\ \textit{Biábuka} \text{ or } \textit{Iatibúbuka.} \\ \textit{Liábuka} \text{ (m.) or } \textit{Ialíbuka} \text{ (m.)} \\ \text{or } \textit{Tiábuka} \text{ (f.) or } \textit{Iatibuka} \text{ (f.)} \end{array} \right\}$
Plur.	$\left\{ \begin{array}{l} \text{1st. } \textit{Wia} \text{ ..} \\ \text{2nd. } \textit{Hia} \text{ ..} \\ \text{3rd. } \textit{Nhia} \text{ ..} \end{array} \right\}$	$\left\{ \begin{array}{l} \textit{Iátiwa} \text{ ..} \\ \textit{Iátihũ} \text{ ..} \\ \textit{Ianum} \text{ ..} \end{array} \right\}$
		$\left\{ \begin{array}{l} \textit{Wiábuka} \text{ or } \textit{Iatiwábuka.} \\ \textit{Hiábuka} \text{ or } \textit{Iatihúbuka.} \\ \textit{Nhiábuka} \text{ or } \textit{Ianúbuka.} \end{array} \right\}$

	Perfect.	Pluperfect.	Future.
Sing.	$\left\{ \begin{array}{l} \text{1st. } \textit{Iahátina} \text{ ..} \\ \text{2nd. } \textit{Iahátibu} \text{ ..} \\ \text{3rd. } \textit{Iáhali} \text{ (m.)} \\ \text{or } \textit{Iáhali} \text{ (f.)} \end{array} \right\}$	$\left\{ \begin{array}{l} \textit{Iahatinábuka} \text{ ..} \\ \textit{Iahatibúbuka} \text{ ..} \\ \textit{Iahalíbuka} \text{ (m.)} \\ \textit{Iahatíbuka} \text{ (f.)} \end{array} \right\}$	$\left\{ \begin{array}{l} \textit{Iábatna.} \\ \textit{Iabátibu.} \\ \textit{Iábali} \text{ (m.)} \\ \textit{Iábati} \text{ (f.)} \end{array} \right\}$
Plur.	$\left\{ \begin{array}{l} \text{1st. } \textit{Iahátiwa} \text{ ..} \\ \text{2nd. } \textit{Iahátihũ} \text{ ..} \\ \text{3rd. } \textit{Iáhanum} \text{ ..} \end{array} \right\}$	$\left\{ \begin{array}{l} \textit{Iahatiwábuka} \text{ ..} \\ \textit{Iahatihúbuka} \text{ ..} \\ \textit{Iahanúbuka} \text{ ..} \end{array} \right\}$	$\left\{ \begin{array}{l} \textit{Iabátiwa.} \\ \textit{Iabátihũ.} \\ \textit{Iábanum.} \end{array} \right\}$

It occurs in such phrases as—

Íta bíá? = How are you?

Íta líá lírí? = What is his name?

Chevalier *líá nrí* = Chevalier is my name.

Ínárutí tíá = It is true.

Írua íátiwa = We are three.

In the present and imperfect the personal pronouns may either precede or follow the verb. In the other tenses they always follow it. When that is the case, the particle *tí* is interposed between the verb and the terminal pronoun.

The personal pronoun is suffixed in the following examples—

Karífuna íátina = I am a Carib.

Líbúkaye íátina = I am his brother.

Háíia íátina? = Where am I?

Wákúríali = He is a man.

Yarúíaru = She is a girl.

Tiámatu túha = She is pretty.

(*Tu* and *ru* as well as *tí* are forms of the third personal pronoun of the feminine gender) *Yáru* = a girl; and *íaru* = "she is"; *túha* = she.

The past is indicated by the termination *buka*, which converts the present and the imperfect into the imperfect and pluperfect.

The perfect in all verbs expresses a past definite action or condition, irrespective of time; thus—

Iahátina = I have been.

Súlürühátina = I have come; but when the period of a past condition or action is defined, the past perfect is employed.

Bínarű yahiáhali buka = It was there in olden times.

Kúyarű sülürühátina búka = I came yesterday.

The perfect is formed by incorporating the syllable *ha* in the verb; thus—

Iátina = I am.

Iahátina = I have been.

Ba, which is really the verb "to go," is used to indicate the future.

Iabátina = I shall be, literally, I am going to be.

Bátina = I am going and *ía* = to be.

When the personal pronoun follows the verb *ía*, the interposed particle *tí* is omitted in the third person; thus we have *íali* (masc.), *íati*, *íatu* or *íaru* (fem.) and *íáhali* (masc.) *íáhati*, *íáhatu* or *íáharu* (fem.).

Tina is pronounced as if the *i* were omitted, the vowel being so short ; so that *iátina* and *iahátina* sound as if written *iatna* and *ihátna*.

The verb *ia* is often understood.

Yahátina = I am here (*yaha* = here).

Irufátina = I am good.

Itali ? = What is the matter ?

*Ináru*ti = It is true (*inaru* = true).

In the expression *inaruti tia* = it is (really) true, *ia* is understood between *inaru* and *ti*.

The conditional is thus expressed :—

Present.	Imperfect.
<i>Aónuba</i> If it be I	<i>Aónuba múka</i> If it were I.
<i>Amoróbuba</i> If it be thou	<i>Amoróbuba múka</i> .. If it were thou.
<i>Likuyáluba</i> If it be he	<i>Likuyáluba múka</i> .. If it were he.
<i>Wakuyáwaba</i> If it be we	<i>Wakuyáwaba múka</i> .. If it were we.
<i>Hakuyáhuba</i> If it be you	<i>Hakuyáhuba múka</i> .. If it were you.
<i>Nhakuyánhaba</i> If it be they	<i>Nhakuyánhaba múka</i> .. If it were they.

Likuyáluba, ariakábai lúni lebéloru = If it be he, tell him to come in.

Amoróbuba múka bisikaímuka lúni = If it were thou, thou wouldst give it to him.

The past perfect is formed by adding *ha* to *múka*.

*Aónuba hámu*ka = If it had been I.

*Amoróbuba hámu*ka = If it had been thou, etc.

*Aónuba hámu*ka, *nisikahámuka lúni* = If it had been I, I would have given it to you.

The equivalent of "there is" is *ihai*, which is equal to *iali* or *iatí*, the final *i* being short for *li* or *tí*, and *h'* being inserted for euphony :—

*Ihai ába báru*ru *núma* = I have one plantain = There is one plantain with me. "There is not" is expressed by *ma* or *úa*.

*Mámati báru*ru = There is no plantain.

Úati útu = There is no fish.

Tíscti Kaírabu ? = Is Roseau far ?

Matíscti Kaírabu = Roseau is not far.

¹ I am rather uncertain about the existence of this aspirate in the word which I have written *ihai*. It is possible that it should be written *iai*, and that the idea of an *h* being present between the initial *i* and the *a* is due to the false pronunciation of the Carib who dictated the sentence which I have given as an illustration.

(*ia* is understood in those sentences; and, in the first, *ma* is reduplicated).

The feminine of the personal pronoun of the third person, viz., *ti*, is used in the above expressions, and in many others as frequently and as indefinitely as the word "it" is in English: and such phrases as *Tiseti Kairuta*? are equivalent to those in English, like, "Is it far to Roseau?"

Ka = to have.

The verb "to have" is *ka*. It always precedes both the object and the personal pronoun which is the subject:

Kabarurátina = I have plantains (*báruru* = plantains).

Kahálati = It has something in it.

Kiléweti = It bears flowers (*ílewe* = flowers), literally, it has flowers.

It really consists of an unchangeable particle, *ka*, which indicates possession, and the terminal *a* of which is dropped before words beginning with vowels.

The following are illustrations of the use of *ka* :—

(*Yámati* = Basket, the final *i* being changed into *e*.)

Ka yamatétina = I have a basket.

Ka yamatétibu = Thou hast a basket.

Ka yamatétina búka = I used to have a basket.

Ka yamatchátina = I had a basket.

Ka yamatchátina búka = I had had a basket.

Ka yamatebátina = I shall have a basket.

Ka yámati núba = If I have a basket.

Ka yámati búba = If thou hast a basket.

Ka yámati núba múka = If I had a basket.

Ka yámati búba múka = If thou hadst a basket.

Ka báruru núba, nisíkuba búni = If I have plantains, I will give you some: (*báruru* = plantains; *síka* = to give).

Ka báruru búba, bisíkuba lúni = If you have plantains, you will give him some.

Ka báruru núba múka, nisikámuka ába búni = If I had plantains, I would give you one.

Ka báruru búba múka, bisikámuka ába lúni = If you had plantains you would give him one.

Possession is also indicated by expressions which correspond in construction with the questions :—

Átria búma? = How many have you?

Átri báruru búma? = How many plantains have you?
(*búma* means, literally, with you).

Aba bāruru nūma = I have one plantain (*nūma* = with me).

Aba bāruru būma = Thou hast one plantain (*būma* = with thee).

Aba bāruru lūma = He has one plantain (*lūma* = with him).

Absence of is expressed by *ma* which is used in the same way as *ka* :—

Mabarurūtina = I have no plantains.

Mabarurūtibu = Thou hast no plantains.

TRANSITIVE VERBS.

Most transitive verbs are conjugated like the verb *atūka* = to do.

Person.	Present.						Imperfect.
1st ..	<i>Natūkaya</i>	..	..	..	..	..	<i>Natūkaya búka.</i>
2nd ..	<i>Batūkaya</i>	..	..	..	..	..	<i>Batūkaya búka.</i>
3rd {	<i>Latūkaya</i> (masc.)	..	..	..	..	..	<i>Latūkaya búka</i> (masc.).
	<i>Tatūkaya</i> (fem.)	..	..	..	..	..	<i>Tatūkaya búka</i> (fem.).
1st ..	<i>Watūkaya</i>	..	..	..	..	..	<i>Watūkaya búka.</i>
2nd ..	<i>Hatūkaya</i>	..	..	..	..	..	<i>Hatūkaya búka.</i>
3rd ..	<i>Nhatūkaya</i>	..	..	..	..	..	<i>Nhatūkaya búka.</i>

Person.	Perfect.						Pluperfect.
1st ..	<i>Atūkahátina</i>	..	..	..	..	..	<i>Atūkahátina búka.</i>
2nd ..	<i>Atūkahátibu</i>	..	..	..	..	..	<i>Atūkahátibu búka.</i>
3rd {	<i>Atūkaháli</i> (masc.)	..	..	..	..	..	<i>Atūkaháli búka</i> (masc.).
	<i>Atūkaháti</i> (fem.)	..	..	..	..	..	<i>Atūkaháti búka</i> (fem.).
1st ..	<i>Atūkahátiwa</i>	..	..	..	..	..	<i>Atūkahátiwa búka.</i>
2nd ..	<i>Atūkahátihū</i>	..	..	..	..	..	<i>Atūkahátihū búka.</i>
3rd ..	<i>Atūkahátinum</i>	..	..	..	..	..	<i>Atūkahátinu búka.</i>

Person.		Future.	Person.		Future.
1st ..	..	<i>Natūkuba.</i>	1st ..	..	<i>Watūkuba.</i>
2nd ..	..	<i>Batūkuba.</i>	2nd ..	..	<i>Hatūkuba.</i>
3rd ..	{	<i>Latūkuba</i> (masc.)	3rd ..	{	<i>Nhatūkuba.</i>
		<i>Tatūkuba</i> (fem.).			

The imperative is formed by adding *ba* to the infinitive :—

átuka = to do.

atúkaba = do.

atúkabai = do it (*i* is short for *li* = it).

báiba atúkai = go and do it.

atúkabai líha = do this.

matúkabai líha = don't do that.

The conditional is conjugated as follows :—

Person.	Present.					Imperfect.
1st ..	<i>Atúkánuba</i>	..	..	..	..	<i>Atúkánuba muka.</i>
2nd ..	<i>Atúkabuba</i>	..	..	..	..	<i>Atúkabuba muka.</i>
3rd {	<i>Atúkáluba</i> (masc.)	..	..	..	..	<i>Atúkáluba muka</i> (masc.)
	<i>Atúkátuba</i> (fem.)	..	..	..	..	<i>Atúkátuba muka</i> (fem.)
1st ..	<i>Atúkawaba</i>	..	..	..	..	<i>Atúkawaba muka.</i>
2nd ..	<i>Atúkáhuba</i>	..	..	..	..	<i>Atúkáhuba muka.</i>
3rd ..	<i>Atúkánhaba</i>	..	..	..	..	<i>Atúkánhaba muka.</i>

Tikábuba útu, báruba ába nûni = If you catch fish, bring me one.

Nibríbuba yáha, nariakubátibu = When you come here, I will tell you.

Nutainuba mûka Kairabu, néheru mûka mábi bûni = If I went to Roseau, I would buy potatoes for you.

By prefixing *ha* to *mûka* the pluperfect is obtained.

Atúkánuba hámbuka.

Atúkabuba hámbuka.

Alukurabúbali hámbuka nátûka hámbuka ába yámati bûni =
If you had sold it, I would have made a basket for you.

The object of an action is expressed by placing *lu* or *luni* before the infinitive.

Kátaba basíkai líha ípula? = Why are you digging that hole?

Lûni nabúnaku báruru = It is for me to plant plantains.

Lûni labúnaku kiere = It is for him to plant plantains.

Nisíkuba líha bûni lu béheru úihi nûni = I give you this to buy meat for me.

A gerund-like form of the verb is found in such sentences as :—

Barumukayábuka, batúkúbali = You were sleeping, while you were doing it.

Narikubátibu mamárākā, nasukurúbai = I will look at you to-morrow, when I am passing.

The termination *úbali*, which is that of the gerund, would be similar in form to that of the future indicative and the present conditional, but for the additional syllable *li* in the former. Another ending of the gerund is *úbame nibrinúbame, neherúbali búni* = when I am coming, I will buy it for you.

The termination of the present indicative, such as it is found in *natúkaya*, suggests a compound of the infinitive *átuka* and *ia* = to be, as an auxiliary, so that the verb might be written *natukáia*. This view is supported by the structure of the present indicative of the verb *watikámare* = to work, which is *nivatakimária*, and of that of *akusaku* = to sew, which is *nakusákuya*, which might be written *nakusakúia*. And in favour of this it may be added that I have found it very difficult to decide whether the accent in the above verbs *natúkaya* and *nakusákuya* should be where they are placed or on the vowels which immediately follow the *k*. When, however, we come to verbs ending in *i*, like *iútiri* = to go and *iabri* = to come, we find their present indicatives to be *niútiria* and *niábria*. Yet even here it might be said that the *i* of *ia* has been merged into the terminal *i* of the verb.

The particle *ha* is incorporated with the verb and personal pronoun to form the perfect.

átuka = to do.

atúkahátina = I have done.

This, at least, should be the regular formation of the perfect. But, in conversation, the *ha* is practically dropped and *atúkahátina* becomes *atúkátina*. Similarly *watikámare* and *iabri* become *watikamarétina* and *iabritina* in the perfect. When however, the verb ends in *u*, there is a recurrence to the *ha*, as in *akúsaku* = to sew, the perfect of which is *akusakuhátina*.

Súlürúhali wéyu = the sun has risen (literally, has arrived).

Eheruhátinwa ába yámati = we have bought a basket.

The perfect may also be constructed by adding *muti* to the infinitive, the personal pronoun being joined to the former.

Sa = to cut.

Sa námuti = I have cut.

Sa búmuti = Thou hast cut.

Sa lámuti = He has cut.

Sa wámuti = We have cut.

Sa húmuti = You have cut.

Sa nhámuti = They have cut.

Kúrákua = to tie.

Kúrákua námuti, kúrákua búmuti, etc.

The imperfect and the past perfect are formed by adding *buka* to the present and the perfect.

In the future, the terminal vowels of verbs ending in *a* are dropped and *uba* is added to the remaining portion of the infinitive; *átûka* = to do; *atûkuba* = I shall do. The same rule holds good for verbs ending in other vowels; thus

Infinitive.				Future.
<i>Watikámare</i>	..	..	..	<i>Niwatikamáruba.</i>
<i>Íabri</i>	..	..	..	<i>Niábruba.</i>
<i>Akúsaku</i>	..	..	..	<i>Nakusákuba.</i>

The imperative ends in *ba*; *átûka* becomes *atûkaba*; *watikámare*, *watikamáreba*; *iábri*, *iábriba* *akúsaku*, *akusákuba*.

Reflective verbs are formed by adding *kúa* = self, to the infinitive of the active; *arámeta* = to hide, *arametákua* = to hide oneself.

They are conjugated like the active, the imperfect and past perfect being compounded of the present and the perfect respectively and *bûka*, and the perfect and future being characterised by the incorporated *ha* and the terminal *ûba* respectively; *arametákua* (present), *arametakuahátina* (perfect), *arametákua bûka* (imperfect), *arametakuahátina bûka* (past perfect), *arametakuánûba* (future), *arametakûaba* (imperative).

An intensified reflective is formed by adding the reflective pronoun to the simple reflective; thus

Narametákua núni kúa, etc., = I am hiding myself, etc.

The conditional follows the same rule that governs its construction in the case of active verbs; and so the present, imperfect, and past perfect of *arametákua* are *arametákua nûba*, *arametákua nûba mûka* and *arametákua nûba hámuksa*.

It may be observed that an *n* has been introduced in the future tense between the terminal *a* of *arametákua* and *uba*. This has apparently been done for the sake of euphony. The letter *k* is similarly introduced in the future of *ákaba* = to hear, which is written *nakabákuba*.

In the passive, the tenses are constructed by placing the personal pronoun after the reflective verb, the particle *tí* being interposed between them as in the conjugation of *ia* = to be. The verb *ia* = to be, is evidently understood in all the tenses of the passive:

Indicative.	Conditional.
<i>Arametakuátina, aramatekuátibu, etc.</i>	<div style="display: inline-block; vertical-align: middle;"> <i>Arametakuánuba, etc.</i> <i>Arametakuánuba múka, etc.</i> <i>Arametakuánuba hámuca, etc.</i> </div>
<i>Arametakuátina búka, etc.</i>	
<i>Arematakuahátina, etc.</i>	
<i>Arametakuahátina búka, etc.</i>	
<i>Arametakuabátina, etc.</i>	

Though there is no difference in construction between transitive and intransitive verbs, *arímuka* = to sleep, and *asúaha* = to cut, becoming *narumúkaya*, etc., and *nasúdhaya*, etc., in the indicative present, etc., yet some verbs are conjugated like *ia*, the personal pronoun being suffixed and the particle *ti* interposed between it and the verb. The following are examples of such verbs:

atunuhátina = I am coughing.

asuchátina híta = I am spitting blood.

I have not been able to trace any rule which determines such a difference in construction among verbs; but the verbs conjugated like *ia*, such as the two last-mentioned, are generally, though not always, those which denote a condition of mind or body rather than an action. This is noticeable in such expressions as:

Anukúitina = I am ill.

Abiruátina = I have fever.

Makrabútina = I am thirsty.

Lamátina = I am hungry.

Hanuhutétina = I am afraid.

Kaifutétina = I am afraid.

Ibisikactina = I am ashamed.

Kürétina = I want.

Some of these may be considered as adjectives combined with personal pronouns, the verb *ia* being understood, such as—

Makrabútina from *mákrabu* = thirsty.

Lamátina from *láma* = hungry.

But many of them govern either an infinitive or a noun substantive. Thus we find such phrases as—

Hanuhutétina héwe = I am afraid of a *tête de chien* (a snake).

Kanisítina báruru = I like plantains.

Káta kürétibu? = What do you want?

Arúmuka kürétina = I want to sleep.

Marúmuka kürétina = I do not want to sleep.

Even these also are merely compounds of either nouns or adjectives with personal pronouns. Just as *anukútina* is derived from *anúkui* = disease, and *abiruátina* from *ábiru* = fever, so *hanuhutétina*, *kanísítina*, *kürétina*, etc., are formed by adding *na* to *hanúhuti*, *kanasi*, *küre*, etc., *ti* being interposed.

Chíseti, *kanísiti*, *mátati*, etc., are examples of impersonal verbs or rather of composite words used as such.

Chíseti, *níni nasúaha wéwe* = I like to cut wood.

Kánsiti níni nátúka yá nati = I like to make baskets.

Matátini watakímare = I like to work.

The third sentence is probably ungrammatical and should have been *mátati níni níwatakímare*.

In the first three sentences, the infinitive is used as if it were a substantive with the personal pronoun *ni* prefixed, the *i* having been dropped before *asúaha* and *átúka*, because they begin with a vowel. They should be rendered, if literally translated, as it pleases me, or literally, it is my desire or pleasure to cut wood, to make baskets, to work.

The word *kanísiti* is derived from *ánisi* = heart and hence desire or pleasure. The letter *k* when prefixed thus is short for *ka*, which denotes entirety or completion as well as possession; so that *kanísítina* and *kanísiti níni* may be considered to mean, it is entirely my desire or pleasure, or I have the desire or pleasure.

Verbs of this form of conjugation govern the personal pronouns in the dative:—

Chísetibu níni ? = Dost thou love me ?

Chísetina búni = I love thee.

Káriti nári níni = My tooth pains me.

PECULIARITIES OF THE CARIB LANGUAGE.

The term "Carib."

A modern Carib is called by his countrymen, *Karífuna*. In referring to the whole race of Caribs, the word *Karínaku* is used.

Raymond Breton does not mention *Karífuna*. He calls a Carib *Callínago* and several Caribs *Callínagoyum*. The word *Callínago* is evidently the same as *Karínaku*, the *r* of which has been incorrectly replaced by *ll*.

The name given to themselves by the Caribs of South America is *Karínia*, which is probably derived from *Karínaku*.

It is not, however, from these words that the name Carib has originated. The leeward coast of Dominica is called *Kairabu*,

which is also applied to Roseau, the capital of the island, whose other name is Sairi. Raymond Breton wrote it Caerabone. It seems to me that the word Carib owes its origin to the answer *Kátrabu* given by the Indians of Dominica to the Europeans who first asked them to what country they belonged. Hence the peculiar term Cariboo would, in spite of its singular sound, be really the most correct of all similar names.

Language of the women.

Though the language generally speaking is the same among both sexes, there are certain words in it which are used by the women only. The following are examples of this peculiarity.

	Used by men.	Used by women.
Moon	<i>Nánu..</i>	<i>Káti.</i>
Rain	<i>Kúwúbuí</i>	<i>Húya.</i>
Fish-hook.. ..	<i>Kúwi..</i>	<i>Búre.</i>
Cassava root ..	<i>Ktere..</i>	<i>Kái.</i>
Son	<i>Wúkúri</i>	<i>Éyeri.</i>
Daughter	<i>Wúri..</i>	<i>Yáru.</i>
Pepper	<i>Bürmúi</i>	<i>Ati.</i>
Fowl	<i>Alira</i>	<i>Káyu.</i>
Sea	<i>Bárana</i>	<i>Bárawa.</i>

The most probable of the explanations suggested for the above is the one which supposes that the women who use such words are descendants of some who were captured by the Caribs from other Indian tribes. But this theory is not without its difficulties. All the Carib women use those foreign words, and none of the men do so. It is evident, therefore, that though those words may have been thus introduced into the language, there must have been some custom which, while it made their use general among females, limited them to women only. It has been suggested that the boys used these words until they were of an age to associate with men, when they discarded them as effeminate.

Another theory might be advanced on the subject, and that is that the strange words were introduced by Carib women who had been captured by other tribes and were afterwards rescued.

The probabilities are that, if either theory is correct, both are so. For the capture and rescue of women must have been events of very frequent occurrence among the Caribs and the tribes with whom they were constantly engaged in war.

The resemblances between certain of these alien words and some in the Arawak language point to that tribe as the most

probable source of many, if not of all the terms peculiar to the Carib women.

For example, the word *káti* used by Carib women for the moon is similarly employed in Arawak. While the Caribs in South America have adopted the Macusi word for one, viz., *owi*, the insular Caribs call that numeral *ába*, which is almost the same as the equivalent Arawak word *ábaro*.

WORDS ADOPTED FROM THE FRENCH AND SPANISH.

Many words have been adopted by the Caribs from the Spanish as well as from the French or the French patois of the island, the necessary vowels having been added to the originals to make them conform to the usual Carib orthography.

The following are from the Spanish :—

- Bácasu* (*vaca*) = cow.
- Cábara* (*cabra*) = goat.
- Cábayu* (*caballo*) = horse.
- Cáta* (*carta*) = paper.
- Sálu* (*sal*) = salt.
- Kusúu* (*cuchillo*) = knife.
- Vínu* (*vino*) = wine, etc.

From the French or its patois are derived :—

- Tábula* (*table*) = table.
- Púlatu* (*plat*) = plate.
- Tásu* (*tasse*) = cup.
- Véru* (*verre*) = glass.
- Cúyeru* (*cuillère*) = spoon.
- Búteyu* (*bouteille*) = bottle.
- Sápote* (*chapeau*) = hat.
- Símisi* (*chemise*) = shirt.
- Rúbu* (*robe*) = dress.
- Búrike* (*bourrique*) = donkey.
- Mútoni* (*mouton*) = sheep, etc.

It is singular that the Carib word for salt should be *sálu*, which is evidently derived from the Spanish, *sal*. It is probable that the Spanish word was adopted and used in the place of the original Carib term which became forgotten. For it is scarcely to be supposed that a people living by the sea would not have a word in their vocabulary to express salt.

EXAMPLES OF MODERN CARIB.

ORIGINAL.

I.

Hália lúba narímeta Baraisiri lía líri. Kanianítina núma, wáma bíabri níbaya, bíaba wúkúri, bíaba wúria. Niwatakímare nátúka yámati, nasuáhaya lóni wéwe, niútiri atíaha. Niani arimétatu aútubu, takusákuya, tabuáhaya aíkini, tasibákuya, takúrúhaya kíere, takulúhaya báruru, tabuitáhaya batíruku, tiwatakimária tísari. Níbaya su han awáita; ábana líha wúkúri wairíhali, liwatakimária loníkua. Nukúsuru Karífuna yaru. Múlatu yari nukúsiri. Napúkasa Warísima. Láuse alóaha niani, niútiri Baraisiri. Yáhi nhapúkasa su níbaya.

TRANSLATION.

I.

The place where I live its name is Baraisiri. I have a wife and four children, two boys and two girls. My work is making baskets, cutting down trees, fishing. My wife stays at home; she sews, she cooks food, she washes, she grates cassava, she pounds plantains, she sweeps the house, she works in the garden. All my children are grown up. One of the boys is big; he is working for himself. My mother was a Carib woman. My father was a mulatto. I was born at Warísima. After I took a wife I went to Baraisiri. All my children were born there.

ORIGINAL

II.

Hiakítina láuse láue nukúsiri. Láuse láue nukúsiri narímeta túma nukúsuru. Bínarú háli láuse táue nukúsuru. Mariétina (from French marier) lubarákiwa táue nukúsuru. Atakatu nukúsuru huit (French huit) túbaya. Hílaha six (French six); werémetu bíaba. Táue nukúsuru, Warísima wa búnaha. Bínarú hiláluba ába Karífuna, nha bunáhahi lubuyékua. Kuliha hilákua ába, bakúkuti wa bunáhahi. Bínarú hiláluba ába mútu, nha bunáhahi makáiti; rótiu wewe lábuse, rótiu kiu láuse; rótiu ába púlatu (either French plat or Spanish plato) lóaku lísibu ma búísola kíwa lakúríku. Haugurákua nha mútui nhakabanárúku.

TRANSLATION.

II

I was little when my father died. After my father died I lived with my mother. It is a long time since my mother died. I married before my mother died. My mother had eight children. Six died and two remained. When my mother died, we buried her at Warisima. In olden times when a Carib died we buried him in his own house. Now, where anyone dies we bury him outside. In olden times when a person died, they buried him without a coffin; they put a board under him, they also put one over him; they put a plate on his face to prevent the earth from getting into his eyes. They wrapped him up in his bed-clothes.

ORIGINAL.

III.

Lubarákiwa iútiri abunákua, wa súaña waíriti wéwe lawará-hatu. Háwara nháluba, iútiri akútai. Kutawaháluba, iútiri araúhai. Lubarákiwa wa ákutu, abaihátiwa. Su wa múti abútaha líha kárav lóni wa kútaha. Kíbeti lánúkú wéyu lubarákiwa lákutu waíriti wéwe. Hikuhálubali wátu, báisi tiliháluba, iútiri awáuha lóni wa abúnaku kiere. Wa súaña kiere akusa, lóni wa abúnaku.

TRANSLATION.

III.

Before we begin planting we cut down the large trees to let them get dry. When they are dry we begin to set fire to them. After we have burnt them we clear the ground. Before we burn, we cut away the undergrowth. We collect all the undergrowth together to burn it. The large trees are a long while before they burn away. When the fire is extinguished and the ashes are cold, we begin digging to plant the cassava. We cut up the cassava sticks to plant them.

ORIGINAL.

IV.

Atúka kréti mútu ába báti, líuti árabu asúaaha luwéwéri lóni átku lúbana. Sulaháluba asúaaha luwéwéri, larurákuni rulú-muti tímase lúbana lóni lukiwécha. Sulaháluba akiwécha su luwéwéri, líutiri asánaha húwa, lóni lístkuni luakáburi. Rulú-muti wákabu ípuláruku bukíta lumuti húwa, ípuláruku láo

wákabu. Bárati wéwe, lahubiha hūwa láo wákabu. Lakūrákua misípeti wéwe láo akúruka láaku líbiri wákabu, kūrákua yatiwa rayati wéwe láaku misipe. Rayati wéwe, bayarákua láa líri. Liútiri áuka wirikáburi, lóni lakūraku láaku, lóni labútaha lúbana. Labútaha wirikáburi lao musiere.

TRANSLATION.

IV.

When a person wants to build a house, he goes into the woods to cut the wood to build his house. When he has finished cutting the wood, he drags it and puts it near to his house to prepare it. When he has finished preparing all the wood, he begins to dig the ground and fix the posts. He puts the posts in the holes; he fills the holes with earth round the posts. He takes a pole and he rams the earth round the posts. He ties long poles with creepers to the tops of the posts; he ties cross-poles on the long ones. The cross poles are called *bayarákua*. He goes and cuts poles to tie on top to make the roof of the house. He covers the poles with leaves (*musiere* = a broad short leaf specially used for that purpose).

JUNE 15TH, 1897.

A Special Afternoon Meeting

was held on this date at the South Kensington Museum, when Mr. A. P. MAUDSLAY gave a lecture on the "Maya Monuments and Inscriptions in Central America."

The Meeting was attended by many of the Fellows, and the interest of the lecture was increased by the exhibition of a collection of casts from the various monuments spoken of.

A vote of thanks was passed to Mr. Maudslay on the proposal of Mr. CLEMENTS MARKHAM.

A YEAR in AZIMBA and CHIPITALAND: the CUSTOMS and SUPERSTITIONS of the PEOPLE. By H. CRAWFORD ANGUS, Esq.

LEAVING Blantyre, British Central Africa, in October, 1895, I proceeded to Azimba and Chipitaland for the purpose of hunting and of obtaining labour for the plantations in the British Protectorate. I was away for five months on my first journey and after a short visit to Blantyre I returned and spent six months, again in the same country.

During the period of twelve months or so above indicated, I travelled over large tracts of country; reaching as far as Angoniland in the north and in the south as far as Tété on the Zambizi; I penetrated into Chipitaland as far as the Kapochi River at its junction with the Luia River, a tributary of the Zambizi, returning by Katusa and Kasitu to the Revubwe and thence to Blantyre. A glance at a recent map of Central Africa showing Portuguese territory will explain the route taken.

I found the people warlike and hardy, living, as they always do, at war with some one—fighting is second nature to them, and their deadly accuracy with the bow generally secures them the victory in a fight with either the Angoni or Chikmeda. I found them friendly to the English, and only on two occasions in the whole of my wanderings had I to defend myself from hostile attack. On one occasion my assailants were under the impression that I was a Portuguese, and this cost me one of my men, who was killed by an arrow; but I soon beat them off, and they assumed a more peaceful attitude when they discovered that I was an Englishman, and they brought peace offerings and eventually paid compensation for the man who was killed.

On the other occasion, some Chikmeda from Makanga tried to rob some of my men of their food, and, on their resisting, fired on them, but on our opening fire on them in our turn they soon decamped with some damage.

Large numbers of elephant are killed every year in Chipita and Azimbaland, and game is plentiful, consisting of buffalo, rhinoceros, eland, hartebeeste, zebra, sable-antelope, and smaller buck. Lions and leopards are plentiful and do great damage among the village herds and flocks.

I had some good "bags"; my biggest "bag" in one day consisted of seven buffalo, three eland, one rhinoceros and one leopard.

With regard to the future of trade and commerce in those districts, and the prospect of their proving a source from which

native labour might be drawn, I am of opinion that under the present rule nothing can be done.

The Portuguese within whose territory those districts lie favour the evil system of letting out their different districts to any one who will pay them tribute or taxes, and they shut their eyes to anything and everything that goes on as long as they are regularly paid.

A typical case is Chimsinga, the great Makanga chief. He is supplied with powder and guns by the Portuguese, and is allowed to levy war whenever he wishes as long as he pays a certain yearly tribute to his patrons.

Chimsinga's chief delight is in killing the people who are helpless, and in slave catching, and he levies war on all around him, on every one whom he thinks weaker than himself. He has had, I ought to say, three bad beatings this year, in all cases losing large numbers of men; when he attacked Kotaga this year I was not three miles from the place where he was fighting, and could plainly see his men running for their lives, pursued by the relentless Chipita with their deadly bows and poisoned arrows.

The effects of this evil system of government are, that the natives hate the Portuguese and distrust and despise them so much that I am of opinion that any Portuguese paying a visit to Chimsinga at the present time would run a poor chance of his life.

The price of slaves averages about 4s. to 6s. each, and children from 3s. to 5s. each; the chief market is Tête, on the Zambizi, the Portuguese headquarters there, where a ready sale is found among the Portuguese police and servants, and among the officers even and other inhabitants.

I am certain that until peace is secured to the inhabitants of these countries and the confidence of the people gained by conduct free from deception and treachery, the country must remain unsettled and uncivilized. Who can expect men to turn to profitable work when their absence is seized on as an opportunity of raiding their village, and they return to find their houses a heap of ruins, their relatives fled or slain, and their wives and children taken captive to be sold as slaves among the servants of a nation which in violation of every treaty and at the sacrifice of all honour and humanity, still countenances, yea, even nourishes, the detestable trade in human flesh?

The Azimba are a people inhabiting the country lying to the west of the Shirè river, between the Mwanza and the Revubwe rivers; they can hardly be considered as a distinct tribe, though they undoubtedly belong to the Bantu race; their language is allied to Manganja but is intermingled with Chickmenda and Chipita.

Before the arrival of the Angoni (Zulus) in the country now known as Angoniland, the district which I have above indicated and which may be called Azimbaland was inhabited by a tribe of unmixed Manganja under a very powerful chief named Kasuza. Soon the Angoni began their attacks and after some years of brave but fruitless struggle the chief Kasuza and his people resolved to seek a home elsewhere, and set out with all their belongings for the territory of the great Makanga chief Kankemi, to whom they made submission, and by whom they were for a time well treated; but Kankemi soon began to fear their numbers and power and finally disposed of the difficulty by an indiscriminate slaughter of his guests. Old Kasuza and most of his people were killed, but his wife and two children and a few others escaped and returned to their old country, where they found many of their old tribe and numerous aliens settled and able to defend themselves from the Angoni. These people elected Kasuza's wife Nyangu to be their chief, and she remains so to this day, though now old, and blind, and a cripple; but her son is the virtual chief and rules in her stead.

The comparative peace enjoyed by the people under Nyangu and their ability to hold their own against the Angoni, has induced the settlement of many aliens among them from time to time—Chikmeda, Chipita and runaway slaves from Angoniland and others, and the consequent intermarriages have produced a race very different in language and customs from the old Manganja tribe.

Customs, Superstitions, etc.

"*Mzimu*"—*Spirit Worship*.—*Mzimu* is the name given to that unseen power which the natives believe in, but cannot understand. There are, in every village, small houses consecrated to the use of this spirit, and in these houses are placed grain, flour, pipes, tobacco, mead and beer, the offerings being generally accompanied by prayer or thanksgiving for some prayer granted. There is in the native idea evidently a multiplicity of spirits, and the houses built for their use vary in number according to the number of spirits which the builder believes in or worships. One house may have in it two temples, and another may have five or as many as eight; the worship however is the same for all.

In each village or collection of villages, there is a high priest or *mambu* whose duty it is to propitiate the spirits and to forward on all prayers and supplications. A man wishing for success in hunting, or for children, or for a good crop, or for rain, will make his wife brew beer and will call up the *mambu* and all the villagers, giving the beer into the hands of the

mambu. The *mambu* pours a small quantity of the beer into a receptacle in each temple and a quantity is spilt on the ground, and he then recites a form of prayer in accordance with the wishes of the suppliant, all the villagers joining in a kind of moaning chorus. The *mambu* then distributes the rest of the beer among the suppliant and his friends—he is supposed to give an immediate answer to the prayer.

A man returning from a journey, before he enters his house or the house of a neighbour, will go with his wife and kneeling and clapping hands in front of the *mzimu's* house, will return thanks for his safe arrival.

A man wishing for the death of an enemy will go to the temple with an offering before taking any steps to carry out his wishes.

The *mambu* is generally a pretty wide-awake sort of a person, and is quick to take advantage of any power he may obtain over a suppliant.

In the native mind this unseen power appears to be divided into numerous spirits each with special attributes, and whose numbers are not known. There is the spirit which presides over crops and rains, the spirit which protects against witches, the spirit of hunting, the spirit of health, the spirit of child-bearing and numerous others. A man may perhaps have only two temples erected, and on a calamity befalling him he will go to his *mambu* and seek advice in his trouble; he will most likely be told that he has forgotten one of the spirits.

The worship is inextricably mixed up with sorcery, sensuality and crime.

Ula.—The oracle. The *ula* plays the most important part in native life of any belief existing in Central Africa; it is in close alliance with spirit worship, and is worked by the *mambu* or high priest only.

The *ula* is a small cup round the edge of which are fixed a number of lumps of beeswax at intervals; in the cup is placed a small horn, the base of which is covered with beeswax coming to an oval point, and inside the horn is placed some supposed powerful medicine; the cup is held in the left hand and the right grasps a small rattle; the cup and rattle are then shaken slowly and rhythmically with a circular motion, the result being that the horn in the cup wobbles about, now striking this side and now that side of the cup, the *mambu* professing to foretell the future by the number of times it strikes certain spots of beeswax on the side of the cup.

The *ula* is used principally to discover whether a certain event has been the act of a spirit or the act of the *mfiti* or witches.

When a man is taken ill, however slightly, his friends will go to the *mambu* and request him *Kuombesa ula* (to consult the oracle), and tell them the cause of their friend's illness, its remedy, and whether he will recover; the *ula* is then consulted and the answer given. If the answer is that some one has bewitched the patient and it is such and such a man, the man named is instantly accused and is made to drink *mwasi*, ordeal poison; if he dies the sick person is supposed to recover, if not the *ula* is said to have lied, and another *ula* is consulted. In case of the answer being the "spirits have afflicted him, he has offended some spirit," an offering of beer is generally placed in all the temples and sometimes a new temple is built when the spirits are supposed to be propitiated.

In all cases of perplexity or a wish to know the future, the *ula* is consulted. A man going fishing or hunting will consult the *ula* as to his prospects of success; or going on a journey he will inquire as to his safe return, and his actions are irrevocably guided by the answer received.

I may mention my own experience of the *ula*.

I was at a village on the Revubwe awaiting the return of messengers whom I had sent to a distant chief and about whom I was becoming anxious, so more in the hope of catching a high priest "tripping" than anything else I consulted the *ula* as to when my men would return; the answer was "send two men to-morrow to Chuwali" (a village about fifty miles distant and quite away from the route which my men would have to take), "and they will return with your messengers in four days."

I sent the two men as directed, and in four days they returned with my messengers, who had arrived at Chuwali on the day that they had arrived there. I asked my messengers why they had gone to Chuwali, as it was quite out of their way; their reply was that they had heard that there was "war" on the direct road and they had avoided it accordingly; so I did not catch the high priest "tripping," and without further comment I present the episode to the Society for Psychical Research.

Witchcraft—"Mfiti."—Witchcraft, as in all parts of Africa, is much believed in, and all sorts of charms and medicines are used to ward off the *mfiti*, which in the native's imagination dog his existence.

The *mfiti* is believed to be an eater of human flesh, and all deaths are attributed to the desire of the *mfiti* to devour the bodies of the dead. In the case of a number of deaths in a village a council is called, and the existence of *mfiti* is declared. *Mwasi*, or ordeal poison, is produced and drunk by all the

inhabitants; should no death result from this, the *ula* is then consulted as to the location of the *mfiti*, and another village is probably indicated, and again *mwasi* is produced and drunk by the village so denounced and so on until the *mfiti* is at last supposed to be discovered.

On a death occurring, the body is carefully guarded against *mfiti*; the body is allowed to lie unburied in the house attended by watchers until it is much decomposed and in a state unfit for even the *mfiti* to consume; it is then buried. While a body is lying unburied, people will not walk out at night except in bands, as the *mfiti* is supposed to be abroad.

Every house has its *mfiti* medicine, generally over the door of the house to ward off evil, and in case of a death occurring in the house, the medicine is supposed to have lost its power, and a new supply is obtained.

"*Mwasi*"—*Ordeal Poison*.—*Mwasi* is obtained from a tall grey-barked tree with dark round leaves which is to be found high up in the mountain gorges, frequently at the side of a stream; from the bark of this tree the *mwasi* is produced as follows. The accused person or persons and their accusers and their friends proceed in search of the bark, and when a sufficient quantity has been collected it is pounded in a native *ntondo* or mortar, the pounded bark is put into a small cup and water is added; a small stone heated to redness is then dropped in and the poison is then drunk, the accused man, before drinking, saying, "I am innocent of that of which I am accused. If I lie, may this *mwasi* kill me." If the swallowing of the poison is succeeded by vomiting, this will generally occur within four hours and the man is safe and *therefore innocent*. In fatal cases death generally ensues within twelve hours, but in some cases not until eighteen or even twenty-four hours.

In order to account for the fact that while one man may die of the poison, another may escape, it has been said that the quantity given is varied by the witch doctor, or that he in certain cases only adds some other ingredient which has fatal effect, but to any one who has seen *mwasi* administered, such an explanation will not hold good, and the only conclusion to which I can come on the subject is embodied in the old saying, "What's one man's meat is another man's poison."

Deaths from *mwasi*, I should think, average as low as ten to fifteen per cent.

"*Maliro*," or *Death Ceremony*.—On the death of a man, his relatives and friends collect outside his house and mourn for a period extending over four or five days, singing dirges all day and at night firing guns and beating drums, all the time keeping a careful guard over the body. The near relations mourn apart,

walking up and down, wailing and beating their breasts and throwing ashes and dust on their heads.

On the day of burial, the burial party collects, and all the dead man's effects are burned; the body is then carried to the grave amid more firing of guns and wailing. On the return of the funeral party from the grave, the deceased's house is pulled down, his pots broken and pieces of cloth hung on sticks over the ruins; but this frequently does not occur till some time after the burial.

About a month after the funeral, a beer drinking takes place, and all the friends of the deceased shave their heads and the proceedings are at an end.

During the mourning, large quantities of food are supplied to the mourners, but no beer is drunk.

Human sacrifices.—In Azimbaland the custom of sacrificing human victims on the graves of the dead still exists.

When a chief or any one of importance dies, presents of slaves are sent in by all the neighbouring chiefs as an offering to the spirit of the departed. The women slaves must be young and comely and the men must be youthful or middle-aged. On the eve of the ceremony the victims are all gathered together and carefully washed and their heads oiled and painted red; they are then dressed in all the most gorgeous clothing available, prints, blankets, beads, brass wire, red cloth, etc.

On the morning of the burial the victims are led out and feasted, fowls, goats and other food being prepared for them: they are then marched off to the grave marching with an escort in front of the body of the dead chief; on arriving at the grave they are led forward to the brink, and after a blow on the head with an axe their throats are cut and they are thrown in.

When all the victims are despatched, the body of the deceased chief is laid on the top and the grave is filled in. Should the victims be too numerous to allow of their being placed in the grave, they are killed on the top of the grave and their bodies left exposed.

Native law.—Native law is in many respects wise and just; based upon the opinions and desires of the people, it is undoubtedly popular, and though of course much entangled with superstition, it is wonderful how in some points it comes up to the standard of European justice. The accused is allowed to plead for himself, and witnesses are called to establish and prove a point.

False evidence is punished by death or a heavy fine. Though the chief is the superior power, yet his headmen and people really form a sort of jury, and the chief, however powerful, dare not act against their verdict. A man accused of murder

has the choice of several courses should the case go against him. If he knows he is guilty he will either give himself as a slave to the heirs of the dead man, or, if he has any human property such as a wife or a child, he can give one of them instead. If he is innocent, he will appeal to *mwasi* (ordeal poison), which will never be refused him, and in case of his surviving the ordeal, he can claim compensation of three goats from his accusers. A guilty man will not drink *mwasi* because the native idea of the power of *mwasi* to distinguish between the guilty and the innocent is so deep-rooted that, to a guilty man, it would be like choosing certain death.

Theft by night is punishable by death. Theft by day is punishable by a fine. Adultery is punishable by death, unless the accused has property sufficient to satisfy the law, but he can claim the ordeal *mwasi*, or the ordeal by hot water, in which case he plunges his hands and arms into a pot of boiling water slowly three times up to the elbows; should the arms blister and peel he is guilty; should those symptoms not appear he is innocent, and compensation is paid him.

Petty misdemeanour and even impertinence are also brought to trial, and punishments for such breaches of the law inflicted. While the question of guilty or not guilty is decided by the native jury, the final decision as to the punishment lies with the chief, who has the right to mitigate the punishment in any case at his own discretion; and a man confessing his guilt, and throwing himself on the mercy of his chief, *Kupata myendo* (to catch hold of his legs), is rarely denied mercy.

A wise and merciful chief will have a thousand men ready to defend him in an emergency, while a brutal and cruel chief will have no one to rely on in time of trouble. I give a case of a chief's justice. I happened to be at the village of Kasuga, one of the biggest Azimba chiefs, when some men came in, and falling before him said, "We are your children, you are our father, and we come to appeal against your brother at the Dwenilo River, whose slaves we are." Their story was that this brother of Kasuga, one of Kasuga's headmen, had that day sold some people to another chief for salt; among those sold was a child of one of the complainants. The man was a slave, but he had married a free woman, and therefore his child was by law free. In spite of this, however, his child had been taken and sold. Kasuga instantly sent a messenger calling in his brother, of whom he promptly asked why he had done this thing. The reply was, "Oh, my brother, what does it matter, the complainant is a slave; you are surely not going to take a slave's part against me who am so powerful." Kasuga looked at his brother and said, "Unless the child you have sold is delivered

to me to-morrow, you leave my land and I place another headman there in your stead; also you shall give your own child as a slave to the man whom you have wronged." The brother went away, and next morning brought back the stolen child and his own child as ordered. Kasuga took the stolen child, and returned it to its father; then he said, "Oh, my brother, you are wise; take away your own child. I let you off the punishment, but don't do it again; how can I be strong in war, if my people are treated unjustly?"

Poisons, medicines, and native surgery.—Among the numerous trees and shrubs which grow in the country, many valuable drugs may undoubtedly be obtained. Many are known to the natives, and are used by them in cases of sickness. This knowledge is, however, guarded most jealously; but by feigning sickness, and in some cases being really ill, I have collected a few of the most important. One of these is, so far as I can discover, a powerful anæsthetic, and I have on more than one occasion used it with great benefit. The drug is a root which is boiled in water, and the decoction is then applied to the part affected; the application continues till pain ceases.

In a case of toothache which had given me several sleepless nights, I found this drug most efficacious, the pain, after several applications, ceasing, and in a few hours a small quantity of pus issued from the tooth. The sensation produced is much the same as that produced by cocaine, but rather more powerful, and the fingers when immersed in the liquid become quite numb.

Another much-used drug is that for procuring abortion, and I have collected a small quantity of it. The action is quite harmless, and it generally takes effect in course of two or three days; the effect is said to be lasting, inasmuch as a woman, having taken this drug and at some future period desiring to become a mother, will go to the medicine man and obtain another drug which will counteract the effect of the one taken perhaps years before. I was unsuccessful in my attempts to obtain a specimen of this antidote.

There are several efficient blisters known and sometimes used, but the native is much averse to making use of a remedy which will give him pain, however beneficial its effects may be.

Cupping is much resorted to. The instrument used is generally a small horn open at the tip as well as at the base, the tip being surrounded with beeswax. The part to be cupped is first lanced with a small knife, and the base of the horn placed over the part affected; the operator then places his mouth to the open tip of the horn and sucks out the air, closing the hole at the tip by forcing the beeswax over it with his tongue; a considerable quantity of blood can thus be drawn off.

There are many poisons in use among the natives, the most powerful being obtained from the gall of the crocodile, and also from the gall of the hartebeeste. Death generally takes place within half-an-hour after drinking either of these poisons.

A chief, who had designs on my life, sent me a present of a pot of native beer, but luckily I was warned when about to drink it. I administered a portion of it to a fowl, and death occurred in fifteen minutes. The poison used was from the gall of a crocodile. There are two kinds of poison used for the tips of arrows, the one and only kind known among the Yaos being used for killing game; the part touched by the arrow being cut out, and the rest used for food.

But in Azimba and Chipitaland a much more deadly poison is used, namely, the "war poison." The action of this poison is most powerful, and there is no known remedy for it; the slightest scratch by an arrow tipped with this poison means certain death.

This poison is known only to the chiefs, and the secret is most jealously guarded; the poison is collected by them only and served out to their men, who pound it, and cover the points of the arrows with it.

I was fortunate enough to see a man who had been wounded by one of those arrows, and I watched the symptoms till his death.

The doomed man had been wounded slightly on the lip, the arrow having just grazed him and raised the skin. In about fifteen minutes after being struck he began to tremble, and at last fell to the ground, his limbs twitching violently; in about six hours his arms and neck began to swell, and assumed a dark and puffy appearance; shortly afterwards sores began to break out and his whole body assumed a swollen and unwholesome appearance, the sores increasing in size and exuding an unhealthy matter.

In about twelve hours after severe struggling and violent paroxysms, death ensued. Strange to say, the wound on the lip where the arrow struck had a quite healthy appearance, and did not swell or present any abnormal condition. The temperature during the whole time was high, 103° to 105° , and the pulse fast and feeble; towards the end the pulse was not noticeable at the wrist, and the temperature fell considerably below normal. A few hours after death the body was so decomposed that it was impossible to touch it, the skin peeling off wherever a finger was laid.

I have obtained two of those arrows, their points covered with the poison.

To attempt to describe the manners, habits, and etiquette of the people would be a labour which I am not at present able to undertake, and would occupy a much greater space than would probably be at my disposal.

TOARIPI.

By the Rev. Dr. JAMES CHALMERS.

THE Toaripi or Motumotu tribe, situated in the Gulf of Papua in Freshwater Bay, is perhaps the most interesting of all our New Guinea coast tribes. Until lately they were the terror of all the other tribes from this to Kerepunu or Kerpara, and verily believed that they had a right to take what they desired from every plantation they found. Had the people of a village only the courage to remain at home when the Toaripians were journeying, and when they came to their village receive them and treat them to food and cocoanuts all was well, and they were left unmolested, but on their arriving at a village and finding all the inhabitants gone, they killed every pig they found and robbed all the plantations, and wound up by turning the houses into w.c.s. Some years ago they took charge of Kerepunu over a quarrel about the selling of sago. On their way down the coast and near to Round Head some natives ashore insulted them; they anchored the canoes, tracked the bushmen, and on nearing the villages were met by an armed party who stood to defend their homes, but being of no use before the marauders, they fell back and made for the hills. The chief of the inland tribe, who with his people came out hurriedly to defend their homes, was the first to fall mortally wounded, and after his people decamped the Motumotuan clubbed to death all wounded ones they saw, including the chief.

In one afternoon they killed thirty-six men, women, and children at Kabadi, and at Partanu, inland of Hall Sound, a few years ago they made a nearly clean sweep of the village.

Once I was going to Port Moresby overland and had as carriers eight men, but on it becoming known we were going by land, a large party of nearly two hundred formed to accompany us as far as Maiva, and then to Mekeo and trade. It was merely a small army travelling, and wherever we were seen approaching, fear took possession of all hearts until they saw white clothes in the crowd. Between Iokea and Oiapu the sun was very hot and the sand very heavy, and we had several rests and smokes. At one of these rests, about midday, sitting beside me were a number of men from fifty to sixty years old, and they were comparing the present with the past. Thinking I was asleep they roused me and said something to the following, viz., "How different this journey is to all others, as formerly we simply robbed every cocoanut grove and yam plantation as we

came along, and what we did not use we destroyed, but on this journey we have not even taken cocoanuts sufficient to assuage our thirst." They went to Mekeo and returned home, and I believe had not a single difficulty in the whole journey, and did not commit any robbery. Such is the effect of mission work amongst them, although they are by no means Christians.

This particular part of the tribe includes all the Motu-motu villages, Moveave, Lese and Iokea, and Kart of Karama, and it is of them I now write.

I shall keep as near as possible to the printed paper sent me by the Secretary of the Anthropological Institute.

They are not hunters, only when they go east to Lese and Iokea they have a run after wallaby, and here sometimes, not often, they enjoy a day in the bush after wild pigs. They are not a pastoral people but are great agriculturists, and live chiefly on fish and vegetables.

They have no boats, but use canoes, dug out of trees felled up the river and floated down. The canoe making is all done close by the village on the river bank. They use paddles made out of one piece of wood¹ and paddle the canoe sitting as a rule. The large canoe used for fighting, and called by them Lakia, was paddled by all standing. The canoes were lashed about 6 feet apart and the bridge in the centre was a platform on which the fighting men stood with a large supply of bows and arrows fastened to the railing.

In hunting pigs they use spears, nets (Plate 153, No. 2), and bow and arrows.

The dog is of great use in hunting wild pig, but more especially to kill when friends arrive, and the eye teeth are of very great value.

The bow and arrow are chiefly used in fighting, sometimes in fishing and hunting the wild pig. The bows are not made here, they come from Namau, the district round Bald Head and Cape Blackwood, 100 miles or so to the north-west.

In fishing, nets² are chiefly used, also bow and arrow, and occasionally a tortoise-shell fish-hook. In fishing with bow and arrow, a piece of mangrove, with part of roots left, is secured and stuck in the sand roots uppermost, for fishermen. to stand on just inside a breaker, and as the fish come in on the breakers they are shot at, and it is astonishing the number caught in this way.

¹ "Ethnographic Album of the Pacific Islands," by Edge-Partington and Heape, 2nd series, Plate 202, No. 2.

² *Ibid.*, 2nd series, Plate 153, No. 1.

³ *Ibid.*, 2nd series, Plate 169 No. 1.

They use no javelins, but some of the arrows have very loose heads so that they may be left in the body.

Nearly all their cooking is done in pots bought with sago from the Motu tribe; sometimes the sago is damped and enveloped in long leaves, those of the Nipa palm, and cooked on the ashes, and often inside these roly poly sago sticks they put fish and shellfish. I have never seen fruit. The sago is cooked in many ways, as porridge with shellfish mixed with it, or leaves from a bush that grows in the plantations, or grated cocoanut; or sometimes as dumplings mixed with grated cocoanut, or cake made by damping the sago, spreading out thin and placing it on a broken piece of Motu pottery. The whole is very much the same as Scotch oatcake is prepared.

A dish much relished is ripe banana and sago boiled together, and when cooked and poured into dishes, the milk from the grated cocoanut poured over it. They also cook taro, yams, and sweet potatoes and sago together. Sometimes food is roasted and turned with tongs.¹

The women are very careful to wash their hands before attending to cooking, and no woman with menses or near confinement and for long after can cook food. I am not aware of any particular observance by the women before cooking.

The women cook the food and dish it, and place it before the men, when all males will first eat and then all females.

Fire is produced by rubbing as in the islands of the Pacific.² It is very seldom allowed to go out. Long, long ago there was no fire, and food was eaten raw until a man Iriarai brought it out of the earth where he was sitting. Everybody was frightened and most ran away, but some said, "Let us keep it now we have got it," and they were only able to do so by rubbing a stick with another.

Houses are built on posts fixed in the ground. From ground to floor of house about 7 feet. House about 30 feet long and 16 broad, high in front, tapering to end and rounded on top.

Mothers and girls sleep together, fathers take boys with them to the *erabo* (*dubu* or temple); very little boys sleep in house with mother, sometimes *all* sleep in house. All young men after a certain feast have their heads shaved, enter the *erabo* and adopt the *si*, a long strip of bark cloth (specimen sent), and remain until their hair has grow long and piggy. During all that time they are not supposed to look on a woman, and are only allowed to go out in the dark.

There is no furniture in their houses except cooking pots

¹ "Album," 2nd series, Plate 194, No. 8.

² *Ibid.*, 2nd series, Plate 174, No. 6.

dishes, fishing nets, and baskets, with odds and ends tied up in them, and a wooden pillow or two.

The villages are laid out in streets, but in no order. Here and at Moveave they are in a circle.

The only plants used for manufacture are bananas, jute, and several bushes, from which a strong fibre is obtained. All these fibres are used in making twine for bags and nets.

Taro, yam, sweet potato, sugar cane, sweet yam, bananas, sago, cocoanut, breadfruit, roseapple mango are all used for food.

Savod, or mulberry, is grown to make *si* that men wear.

The only implement used in agriculture is a long hard stick about 5 feet in length.

Religion and Customs.

They have no real idols, are all mere fetishes or charms. *Samese* or *Lakakare* are worn to keep off evil spirits.

Tiparu.¹—Roaring bull, only seen by men after manhood, and then pigs and much food have to be provided. When the day comes for the feast and the introduction, the roaring bull may be heard from two in the morning and on until sunset. The day before, all females and young people have left the village lest they should hear it and die. I had difficulty in getting one.

Oioi.—Is a mask² worn by some men whose duty it is to look after the taboo. They run and dance through a village carrying a short stick of hard wood, and frighten women and children. These masks are kept in the bush. They are made of native cloth stretched on a wicker frame.³ The cloth is whitened with lime and the face is painted various colours. It comes on to the shoulder whence hangs a long fringe of grass, the same as petticoats are made of, to the waist, and from there to the knees a kilt of the same.

The *Oioi* is the most important, and feasts are prepared for it.

They have nothing they worship that I am aware of, and I know of nothing they make offerings to, unless the sorcerer, who receives armshells, pigs, pearl shell, and food of various kinds.

The people are very superstitious on nearly everything, but are wonderfully free of fear, going about at night without lights or even clubs or any other weapon.

For fuller answers to questions I would refer to notes taken

¹ "Album," 2nd series, Plate 201, No. 1.

² *Ibid.*, 2nd series, Plate 186.

³ *Ibid.*, 1st series, Plate 330, No. 1, and "The Decorative Art of British New Guinea," by A. C. Haddon Cunningham. "Memoirs," x, 189, Plate.

by me seven years ago from an old man since dead, and who I am told now was the only one who knew anything of the past.

They do not cast lots nor have they any poison ordeal. They are not cannibals and never were, detesting it with a great detestation, so much so that some lads I took with me lately to Namau, a cannibal district, would eat no food cooked by others lest it should have been cooked in a pot in which human flesh was cooked.

For funeral rites I would refer to the notes already spoken of. They believe in a future state. After death the spirit hovers about for some time until certain feasts are over, when it departs to the west, with an abundance of food and areca nuts. The canoe containing these is taken to the river at mid-day and left until after sunset. At burial all things of value belonging to the dead are buried, but after an interval taken away, when a feast is prepared and a banana stump is decorated with them, and friends gather round to eat and sympathise.

At death the body is dressed in all the finery and made to sit up until the evening, when it is put in the grave and covered over with a plank.

Some things are placed by the grave, a man's bow with string cut and some broken arrows, and his net bag containing a broken spoon, a few areca nuts, betel peppers, and broken lime calabash, and an earthen dish, broken. The dish is one last used by him. Beside a woman's grave may be seen broken cooking dishes and pots. All carry hair of dead round their necks in knitted bag.¹ Widows wear dress, *Keukai*.² The time of mourning is long continued, and widows and widowers sleep many months by the grave. The first widow's mourning—deep mourning—is to besmear herself with the river mud and go naked.

Arts and Manufactures.

The New Guineans do not spin or weave. The dyes they use are *Naiara* and *Quavi*.

The dark brown dye is procured by steeping the article in the mud for some time. The *Quavi* is scraped and a little water added, when the article to be dyed is placed in it and left.

The *Naiara*, leaves and seeds are put in a pot with water and the article to be dyed, placed on a fire and boiled for several hours.

They have no knowledge of glass. They have as musical

¹ "Album," 2nd series, Plate 103, No. 6.

² *Ibid.*, Plate 177, No. 2.

instruments the drum, *Aopa*¹ used in dances, *Meho*² flute. Blown at side of mouth. *Teto*,³ gong beaten at sea.

They have no knowledge of pottery here, all they use they buy from the Motu tribe about Port Moresby.

Only recently have they used tobacco. From ancient times they have chewed the areca nut and betel pepper with lime.

For smoking they use bamboo pipes, *Kika*.⁴ They use no snuff and have no ceremonies in connection with tobacco smoking.

They have no trade whatever in salt, wine or beer, or spirits.

Their knowledge of medicines is very small. For nearly all sickness they use ginger, and certain leaves they burn and rub the body with or steep in hot water and bathe the body. The sorcerer is supposed to be the great man to appeal to.

Their surgical instruments are pieces of shell or flint, obtained from further east, and small bow and arrows *Siro apo*.⁵

They know nothing about the metals, all iron implements having been introduced. They have no knowledge of precious stones, gold or silver.

Personal Ornaments.

They have no special marks of tattooing cicatrices. Some natives who have been to the Motu tribe get tattooed on breast, but it is not the rule. The tattooing is chiefly done on women, but they being darker than the Motuans, it is scarcely seen.

The teeth are not knocked out but the eyebrows are shaven and the eyelids are painted black or red with the finger, burnt coconut husk being used. *Mori* and *Fatia*.

Ear ornaments are worn by both sexes, but the finer ones by the men.

Women use chiefly *Uakou* and *Burcke*; and *Forova* worn by men. In infancy the ears and nose are pierced. The ornaments are worn as pendants, others inserted in lobe.

They have nose ornaments made from shell and coral, obtained at Port Moresby, but they have no lip ornaments.

The hair in lads about fifteen to eighteen is cut close except a small tuft in front; in children the hair is cut in sections all over the head. Married women shave the head. Young women or grown girls glory in a quantity of hair. They do not dye the hair in any way.

Fufusi.—Lads up to eighteen or nineteen wear a sperran of fibre and at that age enter the *erabo* and adopt the *Si*.

¹ "Album," 2nd series, Plate 167, No. 2.

² *Ibid.*, Plate 197, No. 3.

³ *Ibid.*, Plate 197, No. 1.

⁴ Cf. Plate 318, No. 4, 1st series.

⁵ "Album," 2nd series, Plate 188, No. 3.

Girls and women wear petticoats, *Mate*,¹ made from young frond of sago palm. Unmarried women when dressed wear large petticoats, but when at work wear small ones the same as married women—often these small ones are only front coverings having no back. Sometimes they use only a green leaf, often that is used with petticoat and signifies menses.

They carry shields in fighting, *Naua*,² and on the arm from wrist to near elbow and armlet made of cane, *Moka*.³ The *Naua* is hung on shoulder.

They use bows and arrows and clubs bought in Mekeo and Poti,⁴ and spears, *Haora*.⁵

They have a short stick, *Haca*,⁶ which in quarrels they throw at one another, chiefly carried and used by young men. It is very seldom a young man is seen without one.

They know nothing of carving here. They have no money, and give in exchange for arm shells, pearl shell, shell necklaces, etc., sago and canoes.

I have not yet been able to get any correct information as to their knowledge of the stars and constellations.

For their games I refer to my notes taken long ago and published in "Pioneering in New Guinea."

I know of no ancient stone implements.

They have many ornaments used in dancing (see list of things sent), and many feather headdresses I have not procured.

I know of no property mark. They used wooden pillows, *Iori*, but more frequently do without.

Ethnological Questions.

They live in families but have no distinctive names; except names given to children at birth, and which belong to their own families. Persons of the same name may marry and here even cousins may marry, but not brother and sister.

At certain times there are certain foods forbidden. Youths in *erabo* can only eat bananas and sago, some kinds of fish, and pork. Certain foods lead to obesity and no muscle-strength. A man going to make a new plantation circumscribes his food as he does also if going on a long journey. Mourners can only eat certain foods.

Before setting out on a hunting, fishing, or war expedition, must have nothing to do with women, only eat certain foods and

¹ "Album," 2nd series, Plate 188, No. 5.

² Cf. *ibid.*, 1st series, Plate 282, Nos. 1-2, Plate 283, No. 3.

³ Same type as Plate 313, No. 10, 1st series.

⁴ 2nd series, Plate 189, No. 1.

⁵ "Album," 1st series, Plate 270, No. 1.

⁶ *Ibid.*, Plate 193, No. 7.

sparingly. The old men stay at home and look after the *erabos*, but must on no account go near their wives during the absence of the others, and must not eat forbidden food, lest the expedition should fail. In hunting, fishing, fighting, and long journeys, no particular words are used, but appeals are constantly made to the spirits of fathers and mothers long since dead, to prosper and to keep them. Those left at home on these occasions must not let the fire go out, nor must they have any sexual intercourse, and those left in *erabo* must touch nothing belonging to others, nor eat forbidden food and not much of that allowed.

A man who has killed another must not go near his wife, must not touch food with his fingers, but is fed by others and only with certain foods, and this continues until new moon.

If any of the foregoing should be omitted, bad luck would surely follow. Generally any disaster is put down to the breach of one or other of these things, having been with wife or other woman or having eaten of forbidden food.

When going hunting, fishing, or planting, or fighting, people who meet them get out of the way and say nothing, lest bad luck should attend the expedition.

They have no particular observances at cutting down trees except when a very large tree is to be cut down for a large trading canoe, and then the owner of the tree will not go near his wife or any other woman for some time before and will only eat sago.

Nothing is done at housebuilding, but when an *erabo* is to be built, the chief men are sacred for some time. When finished a fighting expedition is planned and life is taken. On the return of the expedition, if successful, all fire arrows into the peak of the *erabo* with great shouting.

The owner of land to be cleared for cultivation abstains from all sexual intercourse, eats sparingly, and talks little. Before planting, a present of arm-shell, or pearl-shell, or pig, is brought to the sorcerer, who prays for the plantation. When harvest comes he gets the best and then the *erabo*, the remainder kept for family use.

Before eating any food from a new plantation they will have a feast of the food ready and brought from the ground, when sorcerer, *erabo*, and all friends join, then the family can "carry on."

In times of severe drought the sorcerer is appealed to, who, if well paid, will make rain; he also can stop it. He also causes heavy seas so that canoes are not able to get out, but, if paid, will give calm by speaking to the spirit in his bone calabash and squirting his saliva all about. To cause heavy seas he

seizes his foot by the big toe, speaks to it, and then with a jerk stretches it out.

Land is held by sons and daughters alike. See my notes.

The taboo, or *safu*, is imposed by all the *erabos*. A chief man, whose wife has died, asks for a *safu*, and at once it is granted; or a chief dying and a *safu* is proclaimed. It is only over the cocoanuts. It is made known by fastening on sticks at end of villages, leaves of the sago palm, also the same all over the cocoanut groves, and by also fastening cocoanut leaves to cocoanut trees. Any one breaking a taboo is beaten, and if it should be a great taboo when the *oioi* is about, these spirits (masked men) can even take life for breaking the taboo. - Sickness and death sometimes follow the breach of taboo. In the event of breaking taboo and sickness follows, a present is brought to the cause of the taboo, the sin confessed and the sick one recovers.

In May they have their harvest feasts and dances, when young and old join. One day then is set apart for children, when all who can toddle join, dressed in all the finery the parents can command.

Between September and October men about to adopt the belt, *itari*, do so at a large feast in which all join. They have no period of general licence as at Namau.

In times of great sickness they expel the evil spirits of sickness from the village with drum beating, conch-shell blowing, stick beating, fire-stick throwing, and terrific shouting. When mosquitos are bad, certain men dress up in leaves and feathers, and march through village and round it, beating drums and shouting to drive the mosquitos away. At no time have they any general atonement or purification of the village.

They have no formal extinction of fire. Fire is only extinguished on a death taking place in the house.

Their only guardian spirits are those of father and mother, and to these they appeal in distress or want by land or sea.

Chiefs have not necessarily supernatural powers, but a sorcerer is looked upon as a chief. A man here, Hiovaki, is a chief because he has power over the sea and gives calm or storm. Another, Pitiharo, is great because his power is for plantations, and is able to give an abundance of all kinds of food, and can bring rain or sunshine. Here they are not put to death if they fail.

The sorcerer, Pitiharo, eats no big fish, only small ones, and never pig. He sometimes fasts, and then he will not eat taro or yam.

ANTHROPOMETRICAL OBSERVATIONS *on some NATIVES of the*
PAPUAN GULF. By the Rev. Dr. JAMES CHALMERS.

SOME few years ago the Rev. James Chalmers, the well-known pioneer missionary of British New Guinea, made some measurements on several tribes of the Papuan Gulf. These passed through the hands of Dr. Garson, who reduced the measurements from the original English system to the metric system. Later they were handed over to Dr. A. C. Haddon who has determined the indices and forwarded them for publication in their present form.

The tables are arranged in geographical order, proceeding from the west to the east. Samari and Saguane are villages in Ipisia. This is the native name for the southern portion of the large island of Kiwai, which is situated at the mouth of the Fly river. Maipua is a coast village on the Papuan Gulf (long. $145^{\circ} 10' E.$), Orokolo another (long. $145^{\circ} 20' E.$), and Toaripi (or Motumotu) a third (long. $146^{\circ} 10' E.$). The latter is a well-known village on the eastern side of the Gulf. Jokea (long. $146^{\circ} 16' E.$) lies about 15 miles S.S.E. from Toaripi. Chalmers says, "The natives are one with the Toaripians."

For the sake of convenient comparison, the arithmetical means of the measurements and indices taken at each locality are placed together at the end of the tables, and a seriation of the cephalic indices is also given.

The data are not sufficiently numerous to justify any general conclusions being drawn, but the following tentative results may be pointed out:—

The span is, with but a single exception, greater than the height, the mean difference being 64 mm., or $2\frac{1}{2}$ inches, the maximum difference being 144 mm., or nearly $5\frac{3}{4}$ inches.

There is an unexpected prevalence of brachycephaly, especially at Kiwai, where fourteen out of the nineteen measured have an index of 82 or over, the greatest index being 92. At Maipua the people are extremely dolichocephalic and at the same time of short stature (1636 mm., 5 feet $4\frac{1}{2}$ inches). The Orokolo and Toaripi people are evidently allied.

The following is a possible explanation of the facts: the short dolichocephalic Western Papuans extend all along the coast of the Papuan Gulf, and, according to the measurements,

occur in their purity at Maipua. They have been crossed at Orokolo and Toaripi with a brachycephalic people, and apparently the two peoples have amalgamated fairly thoroughly, but this has not yet occurred at Kiwai, so that there is a preponderance of brachycephals.

No correction has been made to reduce the breadth-length index of the heads of living men to that of the skulls.

KIWAI.

	Age.	Height.				Head.			Nose.			
		Stand.	Sitting.	Span.	Cubit.	Length.	Breadth.	Index.	Cheek-bones.	Length.	Breadth.	Index.
SAMARI—	..	1721	813	1829	482	174	149	85.6	133	51	25	49
Maipua	..	1645	816	1756	466	174	149	85.6	136	51	25	49
Dagi	..	1654	797	1797	463	174	149	85.6	129	51	28	54.9
Gagaa	..	1601	800	1711	444	165	152	92.1	136	51	28	54.9
SAGUANE—	..	1721	854	1804	491	171	143	83.6	130	51	22	43.1
Narea	..	1648	800	1772	463	180	149	82.7	140	47	25	53.1
Nadere	..	1660	794	1791	457	178	140	78.6	136	51	27	52.9
Sarua	..	1651	826	1734	463	180	140	77.7	132	44	27	61.3
Ramena	..	1629	844	1734	444	181	136	75.1	133	44	22	50
Naruge	..	1724	829	1824	495	178	146	82	140	54	27	50
Manahu	..	1613	810	1680	457	171	143	83.6	130	51	19	37.2
Amea	..	1677	851	1680	454	174	152	87.8	135	57	25	43.8
Maria	..	1677	822	1747	463	181	143	79	130	47	22	46.8
Eabi..	..	1699	844	1817	491	178	149	83.7	140	64	28	43.8
Sasua	..	1731	829	1861	498	181	149	82.3	135	54	22	40.7
IPISIA—	..	1604	813	1753	470	176	146	82.9	133	51	22	43.1
Naragi	..	1581	844	1690	451	174	143	82.2	130	51	25	49
Musu	..	1654	819	1781	485	184	143	77.7	133	51	25	49
Naot..	..	1581	804	1690	457	165	140	84.8	127	47	25	53.2
Karimi	..	1656 = 5' 5 1/4"	821	1761	468	176	145	83	133	51	25	48.7
Manao	..											

MAIPUA.

	Age.	Height.				Head.			Nose.			
		Stand.	Sitting.	Span.	Cubit.	Length.	Breadth.	Index.	Cheek-bones.	Length.	Breadth.	Index.
Ipai ..	40	—	—	—	—	197	136	69	132	54	28	51·8
Ivaha ..	36	—	—	—	—	200	138	69	138	60	31	51·6
Evava ..	55	—	—	—	—	190	133	70	129	57	25	43·8
Kenia ..	40	1601	804	—	432	190	136	71·5	136	51	25	49
Kaiva ..	48	1680	804	—	438	190	133	70	133	57	28	49·1
Amuru ..	40	1626	813	—	457	190	136	71·5	140	51	28	54·9
		1636 = 5' 4½"	807	—	442	193	135	70	135	55	27·5	50

OROKOLO.

	Age.	Height.				Head.			Nose.			
		Stand.	Sitting.	Span.	Cubit.	Length.	Breadth.	Index.	Cheek-bones.	Length.	Breadth.	Index.
Kiki ..	25	1651	838	1728	444	181	136	75.1	136	57	28	49.1
Hoea ..	35	1613	819	1677	448	181	140	77.3	140	57	28	49.1
Uriliari ..	40	1708	867	1784	435	196	140	71.4	133	57	28	49.1
Aiari ..	40	1584	835	1728	419	184	146	79.3	140	51	25	49
Iaravaki ..	35	1728	864	1823	482	193	143	74.1	133	54	25	46.3
Rape ..	20	1575	750	1613	419	178	140	78.6	130	51	22	43.1
Apove ..	55	1766	870	1880	476	181	140	77.3	135	51	28	54.9
Kearu ..	40	1670	813	1807	482	184	143	77.7	130	51	25	49
Merarike ..	25	1715	810	1820	479	187	140	74.8	127	44	25	56.8
Kauri ..	55	1690	867	1823	482	187	143	76.5	130	47	19	40.4
Hare ..	30	1693	873	1680	457	180	140	77.7	137	44	25	56.8
Melore ..	26	1728	867	1594	473	181	140	77.3	133	47	28	59.5
Mahiro ..	35	1725	886	1778	479	190	143	75.2	130	51	25	49
Harava ..	26	1772	873	1845	491	184	140	76.1	132	54	25	46.3
Hipipi ..	28	1670	714	1687	473	178	133	74.7	127	51	19	37.2
Eope ..	60	1588	810	1680	438	181	140	77.3	127	51	22	43.1
Rihaora ..	65	1636	851	1677	454	190	146	76.8	130	54	28	51.8
		1677 = 5' 6"	836	1741	461	184.5	141	76.3	132	51	25	49

TOARIPI (MOTUMOTU).

	Age.	Height.				Head.				Nose.		
		Stand.	Sitting.	Span.	Cubit.	Length.	Breadth.	Index.	Cheek bones.	Length.	Breadth.	Index.
Pukari..	70	1774	877	1912	501	200	146.	73	135	64	9	14
Rausi ..	60	1683	877	1708	482	190	149	78.4	140	64	13	20.1
Semese ..	65	1740	870	1855	—	193	152	78.5	146	64	28	43.8
Vita ..	32	1657	857	1664	444	193	151	78.2	143	61	31	50.8
Lahari..	42	1700	877	1740	470	181	146	80.6	143	57	31	54.4
Lahio ..	16	1524	781	1581	432	180	146	81.1	132	64	13	20.1
Sivio ..	24	1721	877	1651	463	190	146	76.8	138	70	19	27.1
Fareo ..	18	1645	800	1756	476	187	146	78	133	54	13	24.3
Hari (Jokea) ..	20	1677	832	1831	488	184	146	79.3	130	57	25	43.8
Sarea (Jokea)	36	1831	978	1931	521	200	149	74.5	140	76	38	50
Hauramiri ..	50	1794	918	1918	527	200	143	71.5	144	57	28	49.1
Susume ..	36	1744	851	1880	495	184	149	81	133	57	28	49.1
Kaipu ..	34	1744	886	1817	488	190	152	80	143	57	27	47.4
Posu ..	30	1721	838	1804	441	180	143	79.4	133	51	25	49
Havari..	18	1610	819	1762	460	184	146	79.3	133	54	25	46.3
Hiovahe ..	18	1664	857	1759	457	178	140	78.6	127	51	28	54.9
Siare ..		1702 = 5' 7"	843	1782	476	186	147	77.7	137	60	24	44

	Height.					Head.				Nose.		
	"	Stand.	Sitting.	Span.	Cubit.	Length.	Breadth.	Index.	Cheek-bones.	Length.	Breadth.	Index.
Kiwai	1656	821	1761	468	176	145	83	133	51	25	49
Maipua	1636	807	—	442	193	135	70	135	55	27·5	50
Orokolo	1677	836	1741	461	184	141	76·5	132	51	25	49
Tonripi	1702	843	1782	476	186	147	77·7	137	60	24	44

SERIATION OF CEPHALIC INDICES OF FIFTY-EIGHT
NATIVES OF THE PAPUAN GULF.

	Kiwai.	Maipua.	Orokolo.	Toaripi.
69	—	2	—	—
70	—	2	—	—
71	—	1	1	1
72	—	1	—	—
73	—	—	—	1
74	—	—	1	1
75	1	—	4	—
76	—	—	2	—
77	—	—	5	1
78	2	—	2	4
79	2	—	2	4
80	—	—	—	1
81	—	—	—	3
82	3	—	—	—
83	3	—	—	—
84	2	—	—	—
85	1	—	—	—
86	3	—	—	—
87	—	—	—	—
88	1	—	—	—
89	—	—	—	—
90	—	—	—	—
91	—	—	—	—
92	1	—	—	—
Arithmetical Mean }	83	70	76.5	77.7

QUINARY SERIATION OF CEPHALIC INDICES OF FIFTY-
EIGHT NATIVES OF THE PAPUAN GULF.

Cephalic Index.	Maipua.	Orokolo.	Toaripi.	Kiwai.	
65-69	2	—	—	—	2
70-74	4	2	3	—	9
75-79	—	15	9	5	29
80-84	—	—	4	8	12
85-89	—	—	—	5	5
90-94	—	—	—	1	1
Total	6	17	16	19	58

ANTHROPOLOGICAL MISCELLANEA AND NEW BOOKS.

Readers of the Journal are invited to communicate any new facts of especial interest which come under their notice. Short abstracts of, or extracts from letters, will be published at the discretion of the Editor. Letters should be marked "Miscellanea" and addressed to The Secretary, 3, Hanover Square, W.

Notes on the Chatham Islands.

The following communication has been received from Mr. J. W. Williams of Waitangi West, Chatham Islands, who has during the past year devoted himself to the investigation of the existing memorials of the Moriori race. The search has been an arduous one, and if it has been less productive than had been hoped, the results have not been devoid of permanent interest. Mr. Williams deserves all praise for the energy and perseverance with which he has prosecuted his enquiries under circumstances which were frequently of a rather discouraging nature. It will be seen from the following short summary of his work that the last of the Morioris will soon have disappeared from their ancient home, leaving hardly any traces of their occupation behind them. From an ethnographical point of view the Chatham Islands may now be considered as a field which has been not only reaped but gleaned. Mr. Williams is of the opinion that most of the existing implements and weapons have already been removed from the islands, and that future explorers will come away almost empty-handed. Mr. C. H. Read, to whom the following notes were originally sent, has kindly authorised their publication in the "Journal."

"Waitangi West,
"Chatham Islands,
"4 Feb., 1897.

"A few weeks ago I rode from Waitangi West on the northern shore of Chatham Island to the *Pah* at *Manukau*, the south-eastern point, a distance of forty miles, in order to see *Tapu*, the oldest of the few true Morioris now living. The others are *Wihoeta* living at *Manukau*, *Raupia* at *Matarakau*, *Horimana*, his wife and son living at *Manukau*, *Hapruna* at *Manukau Kirapu* at *Wairua*. *Manukau pah* is pleasantly situated on a slope facing the sea and about a hundred yards from the shore. The land is a Moriori

reserve, that is to say, land set apart for the sole use of the Morioris, and is of exceptional quality. To the southward the beach is backed by high cliffs the façade of which consists of clusters of basaltic columns extending in a westerly direction for nearly a quarter of a mile.

"I found *Tapu* and his wife living in a small *whare* (hut) built of *Punga* (fern tree) and thatched with *Toi toi* grass tied to the rafters with flax. Nicely woven flax mats covered the floor.

"The welcome I received was cordial though gentle and courteous, contrasting strongly with the boisterous and demonstrative greetings of the Maoris.

"Though now somewhat bent with age, being over seventy, *Tapu* is nevertheless a fine specimen of the true Moriori. In stature a few years ago he was 5 feet 9 inches. He possesses an intelligent face, with an expression of candour stamped upon every lineament. The forehead is high, the nose long and faintly aquiline; the eyes large and wonderfully expressive. He spoke in the Maori language, and in the course of his conversation with me, I could not fail to remark the tendency to soften the sound of *ng* in such words as *ngaru* (wave) *ngoikore* (weak) *ngingio* (shrivelled). The peculiar nasal sound represented by *ng* is strongly marked when uttered by a Maori, but amongst other Pacific Islanders this sound is not used. As a matter of fact, if the sound of *ng* as used by the Maoris be exchanged for the simple sound of *n* and *l*, substituted for the *r* in Maori words, the main difference between the Maori language and that spoken by the Kanakas is at once removed.

"Naturally my first questions to *Tapu* were to ascertain if the Morioris now living possessed any reliable tradition as to their origin. Traditions they have in abundance, but they are of too romantic a character to serve any useful purpose. The general belief among them is that they came originally from Hawaiki to New Zealand and from thence to the Chatham Islands. That these islands have been inhabited for hundreds of years is at least highly probable, though it is difficult to say by whom. As regards the daily occupation of the Morioris, most of their time seems to have been utilized in procuring food, making garments and sleeping mats and shaping stone implements. In this last-mentioned industry they show that they possessed considerable ingenuity. Fish hooks and fish spears or gaffs were also constantly required, and these articles were cleverly shaped out of bone. Pendants and other ornaments termed *Reis* for fastening the flax mats worn as garments were also manufactured of bone. The privilege of wearing such ornaments however was confined to chiefs.

"The dwellings were the ordinary *Wharepune* or Δ -shaped huts, constructed of fern tree and thatched with *toi toi* grass, often sufficiently large to accommodate twenty or thirty people. Some of them were ornamented with rude carvings, but as all the *whares* in which the Morioris formerly dwelt, with the exception of a few, have been demolished by the Maoris or have succumbed

to the effects of time, no specimens of their art are now obtainable. Most of the settlements were situated close to the sea shore, one of the principal having been at *Operau*, a sheltered bay in the *Te Raki* district. It was no doubt selected owing to its proximity to the Western Reef from whence seals were and in fact still are obtainable, though not so numerous now as formerly. From *Operau*, voyages were also made to *Rangitutahi*, three precipitous rocks, seventeen miles to the northward of the Main Island, abounding in albatross. Every year the Maoris still go there to procure a supply of these birds, which they send to *Te Whiti* at *Parihaka* in New Zealand. All the Chatham Island Maoris are followers of the so-called prophet. *Operau* is also noteworthy as being the recognized leaping place of the departed souls on their way back to Hawaiki. This belief was general among the Morioris. Cape Reinga, the north-western point of the North Island of New Zealand, was a spot held sacred for a similar reason. The word *Reinga* literally means a leaping place. The superstition attaching to *Operau* was strengthened by the fact that a low range of hills from the interior of the island terminates in this bay in a gradual slope towards the sea, and at the foot of the slope stands an ancient *Ake-Ake* tree. A root of this tree extends to the rocks below in which there is a blow-hole. The wash of the surf against the funnel-shaped opening in the rock causes the air thus compressed to escape from a small opening in the top in a series of plaintive sighs, almost human in quality of sound.

"The Morioris had a confused notion of good and evil spirits, and the aid of numerous deities was always invoked prior to any undertaking of importance. The supposed dwelling place of a beneficent deity was indicated by a rude carving on the bark of a *Kopi* tree, and according to the nature of the enterprise in hand the abodes of the spirits protecting such ventures, were sought out and venerated. I had observed many of these curious marks on the *Kopi* trees in the bush at *Wareama* at the southern end of the *Te Whanga* lagoon, which covers one quarter of the entire island, and was somewhat puzzled as to their significance.

"Prior to the arrival of the Maoris my informant states cannibalism was unknown, and I am quite prepared to believe it, seeing that food was plentiful. They are stated to have lived peaceably along the coasts, spending their time chiefly in procuring supplies of fish, fern root, *Kopi* nuts, mushroom, *Nikau* palm, *Momaku* (an edible fern tree) wild duck and *Pukako* (a large swamp bird). Periodically they put off in rafts constructed of log and kelp, or sometimes in large canoes, to the Western Reef for seals or to *Rangitutahi* for albatross.

"While waiting for a favourable wind in their harbour at *Operau* the time was occupied in the manufacture of stone implements such as axes, adzes, chisels, blubber knives and smaller carving tools. With the large stone axes, tree-felling was no difficult matter. Specimens of these stone implements have been forwarded to the British Museum."

Collection of Photographs and Lantern Slides.

The progress of the collection has not been very rapid, but a certain number of photos, negatives and slides have been received and registered. The principal donor of both categories has been Lieut. Boyle T. Somerville, R.N., who has presented a most interesting series illustrating the New Hebrides and the Solomon Islands, especially New Georgia, on the inhabitants of which island he communicated a valuable paper to the *Journal* last year. Surgeon Frederick W. Collingwood, R.N., has sent photos from the Ellice Islands; and H.H. the Ranee of Sarawak has also presented photos of Dyaks of Borneo.

A certain number of the older photographs formerly in the possession of the Institute have been catalogued and mounted; but it is difficult to make continuous progress with this work without outside aid.

Among the series thus treated may be mentioned one illustrating the Swazis and Swaziland, and the collection of beautiful photos of the Indians of Guiana made by Mr. Everard Im Thurn.

The Institute has also purchased a few slides, amongst which a set of eight, illustrating the making of an adze, from photos taken by Mr. M. V. Portman, in the Andaman Islands, are especially worthy of notice. Further presentations, especially of slides, will always be gladly received.

Note on the Languages of North-West Australia. By
SIDNEY H. RAY, with Aboriginal Vocabularies collected by
E. BETHAM RIGBY.

I. Introductory, by SIDNEY H. RAY.

For the purposes of comparative philology the languages of the native tribes of North-Western Australia should prove to be of considerable interest. In that direction the island continent most closely approaches the Malayan region, Cape Londonderry, the nearest point, being only about 330 miles distant from the island of Timor, or less than half the distance which separates North-Eastern Australia from the Melanesian island of New Caledonia, or the south-eastern parts of the island from Polynesian New Zealand.

Almost the whole of our scanty knowledge of the tribes and languages of the north-west relates to those of the region around Port Essington and Port Darwin, where settlements were made as early as 1831 and 1869. Between the latter place (12° 27' S. lat., 130° 50' E. long.) and the mouth of the De Grey River (20° S. lat., 119° E. long.) no information was available until the collection of the Walki, Munmulla, and Nowilnowilanna vocabularies of the present notice. These were collected by Mr. Ernest Betham Rigby at Wyndham, East Kimberley, during the years 1890-93.¹

¹ They were sent to Professor A. C. Haddon, who has kindly permitted me to make them the subject of this notice.

Mr. Rigby gives the following notes as to the locale and relations of the tribes: "The Walki, Chualinma, or Cowrana tribe have their habitat on the Kimberley gold-fields, being bounded by the desert on the south, the Margaret River on the west, the Yamandil tribe (near the boundary of Western Australia) on the east, and the Ord River (where it crosses the Wyndham road) on the north, there touching the Munmulla or Curramulla tribe. The latter extends to the Denham River or a little north of it, its western boundary being the mountain range, and its eastern the Ord River. The Nowilnowilanna is a small tribe, with the same east and west boundaries, but squeezed in between the Munmulla and the Warrangarra or Coast tribe. It will, I think, soon cease to exist. The vocabularies of the three tribes thus represent the languages spoken over a region extending 250 miles north and south, and varying in width from 200 to 50 miles. The Yamandil tribe, from which I have only a few words, lies to the eastward of the other three, and are more numerous than any, with the doubtful exception of the Walki. The Munmulla seem to have been affected by a mixture of words from the eastern tribe, the Yamandil and Nowilnowilanna by the Coast dialect, but this is only conjecture, as absolutely nothing is known of the Coast dialect. The Coast tribe is called Warrangarra by the Nowilnowilanna, but this may be only a form of their word meaning 'many' (*warrangarri*, five or more). They profess themselves unable to understand these Warrangarra."

Taking the whole north-western region of Australia, from the De Grey River, on the west coast, to the Roper River, on the west shore of the Gulf of Carpentaria, our knowledge of the languages may now be represented by the following table showing tribes, localities, and authorities:—

Tribe.	Locality.	Authority.
1. Ngurla.. ..	Mouth of the De Grey River.	C. Harper in Curr's "Australian Race," i, pp. 292-3.
2.	Roebuck Bay	P. Bassett-Smith, "Journ. Anthropol. Inst.," xxiii, p. 331.
3. Walki	Between Margaret River and Ord River.	Rigby MS.
4. Munmulla ..	Between Margaret River and Denham River.	Rigby MS.
5. Nowilnowilanna	North of Munmulla ..	Rigby MS.
6. Yamandil ..	East of Ord River ..	Rigby MS.
7. Larrakia ..	Port Darwin, from mouth of Adelaide River to Port Patterson.	P. Foelsche in Curr's "Australian Race," i, pp. 258, 259. Rigby MS.
8. Woolna ..	East side of Lower Adelaide River.	Vocabulary, Adelaide, 1869 (reprinted in Curr); A. J. Todd in Curr's "Australian Race," i, p. 262.

Tribe.	Locality.	Authority.
9. Woolwonga ..	Adelaide River	P. Bassett-Smith, "Journ. Anthrop. Inst.," xxiii, p. 331.
10. Oitbi or Bijnalumbo.	South coast of Van Diemen Gulf.	G. W. Earle, "Native Races of the Indian Archipelago," Appendix.
11. Iyi (?)	Popham Bay, west of Coburg Peninsula.	G. W. Earle, "Native Races of the Indian Archipelago," Appendix.
12. Limbakaraja or Yarlo.	Port Essington	G. W. Earle, "Native Races of the Indian Archipelago," Appendix; C. Pasco in Curr, i, p. 269.
13. Unalla	Raffles Bay	P. Foelsche in Curr, i, pp. 274, 275; T. B. Wilson, "Voyage round the World."
14.	West Alligator River ..	P. Bassett-Smith, "Journ. Anthrop. Inst.," xxiii, p. 331.
15. Yaako ¹ or Ter-rutong.	Croker Island and Raffles Bay.	G. W. Earle, "Native Races," Appendix.
16. Jalakuru (?) ..	Mountnorris Bay.. ..	G. W. Earle, "Native Races," Appendix.
17.	Caledon Bay, north-west shore of Gulf of Carpentaria.	Flinders, "Voyage to Terra Australis," ii, p. 215 (reprinted in Curr, i, p. 276).
18.	Roper River, west shore of Gulf of Carpentaria	Capt. Lowre in Curr, i, p. 277.

¹ The words *oitbi*, *iyi*, *yarlo*, *yaako*, mean "no." This method of naming a tribe is common in Australia.

The languages of these tribes are known through very meagre vocabularies, the longest being that of the Woolna, contained in an anonymous pamphlet printed at Adelaide in 1869, and the Walki and Munmulla of the present notice.

With regard to the grammatical structure of the languages nothing is known. Latham in the "Remarks on the Vocabularies of the Voyage of the 'Rattlesnake'" refers to a MS. grammatical sketch of the Port Essington language by Rev. Father Anjello, and makes some extracts. One of the Roman Catholic missionaries at Port Darwin is also said to have compiled a grammar of that dialect. So far as I am aware, these books have not been printed.¹

The pronouns of the Limbakaraja (Port Essington), taken from Anjello's MS., are thus given by Latham²:—

¹ There is also a small school book ("Reading Book for Far North Natives") by J. Flierl.

² "Remarks on the Vocabularies of the Voyage of the 'Rattlesnake'"; Appendix to MacGillivray's "Voyage of the 'Rattlesnake'" (1832). These remarks were reprinted in "Opuscula," by Robert Gordon Latham, p. 229.

Sing. *Ngapi*, I.
Noie, Thou.
Gianat, He, she, it.

Plur. *Ngari*, We.
Arguri, We two.
Noie, Ye.
Ngalmo, They (also = many).

In the first and second persons the pronouns in the other dialects appear as follows :—

	I.	You.
Ngurla	<i>nguanguna, ngi</i>	<i>yinda</i> .
Walki	<i>ngiin</i>	<i>nundu</i> .
Munmulla	<i>ngiin, ngiinoki</i>	<i>üingan, burrumbi</i> .
Nowilnowilanna	<i>ngiin</i>	<i>üingan</i> .
Larrakia	<i>anunga</i>	<i>aejana</i> .
Woolna	<i>tanunga, ungoingi</i>	<i>nitana, nitangi</i> .
Unalla	<i>ngadbi</i>	<i>noyi</i> .

Mr. Rigby has the following note on the Walki, Munmulla, and Yamandil:—"The affixes *-ira* and *-bara* are generally used in the three tribes. They are compounded into *irambiri*, which is best translated by the broken English "Come up." *Ira* is a substantival affix, and is probably akin to the Larrakia *-ura*, used to adapt foreign words, as "pussy-ura," "match-ura," etc. *Bara* is a verbal affix signifying "to do or cause."

The numerals in these languages do not go beyond two :—

	1.	2.		1.	2.
Ngurla ..	<i>purdinal, purda</i> .	<i>kutera</i> .	Woolna ..	<i>tilingita, thidle</i> .	<i>toloya</i> .
Walki ..	<i>cherowi</i> ..	<i>kujära</i> .	Bijnalumbo ..	<i>warat</i> ..	<i>ngargark</i> .
Munmulla ..	<i>cherowi</i> ..	..	Limbakaraja ..	<i>erat</i> ..	<i>ngargark</i> .
Nowilnowilanna ..	<i>cherowi, cheragun</i> .	..	Unalla ..	<i>yardat</i> ..	<i>narakark</i> .
Larrakia ..	<i>kulaguk</i> ..	<i>kalitilik</i> .	Terrutong ..	<i>roka</i> ..	<i>oryalk</i> .

The following short vocabulary illustrates the differences of the dialects :—

	Head.	Eye.	Ear.	Hand.	Sun.	Moon.	Star.
Ngurula ..	milga, yulka..	chidamūra ..	wining, kulka	nara ..	mapil, mopul	wilara ..	noko, ngoko.
Walki ..	tumu ..	molo ..	yardum ..	malla ..	banda ..	kanga..	wārdal-waṅgul.
Munmulla ..	tumu ..	mula ..	yardum ..	mallam ..	banda ..	chowranji ..	wārdal.
Nowilnowilanna..	tumu ..	..	yambirum ..	mallam ..	bundul ..	chowranji ..	wiūwanim.
Yanandil ..	tongola ..	molul ..	karara ..	..	..	..	..
Larrakia ..	maluma ..	limūra ..	banara ..	qirwara ..	lalirra ..	lowrua ..	manalla.
Woolna ..	mūdlo..	ma ..	wāl ..	mānēn ..	ūml. ..	loailyer ..	moailwer.
Bijnalumbo ..	pogal ..	ira ..	kalajah ..	adbirjalk ..	manitj ..	korana ..	argadba.
Popham Bay ..	iwadi ..	jara ..	jalamarī ..	jimilakoji ..	moye ..	orana ..	wilari.
Limbakaraja ..	wakbok ..	ira ..	alajah ..	inbirjalk ..	mowan ..	āli ..	argadba.
Unalla ..	ewalgal ..	yarda ..	alajjar..	ambirkal ..	mowang ..	ali ..	arikatpa.
Terrutong ..	wari ..	dala ..	lomar..	manaweyi ..	muri ..	orana ..	ularit.
Mountnorris B..	ailawal ..	ira ..	alajah..	adbirjalk ..	mowan ..	orana ..	aranut.
Caledon B. ..	..	mēl..	ponduru ..	gong ..	larange, karange ..	kuligia ..	pini.
Roper River ..	mangerāu ..	marqil ..	gowonda ..	..	gonara ..	tanaranga ..	kanaringi.
West Australia ..	kāta ..	mēl..	tonka, jija ..	māra ..	nganga, bāta, jāt ..	miki, mimak ..	ngangar.

In the vocabularies the vowels are pronounced as in German, the consonants as in English: *n* as *ni* in "onion," *ch* as in "church" (written *teh* by Mr. Rigby), *ow* as in "how," *au* as in "fault," *d* as *a* in "was"; *ng* is not nasal.

II. Vocabulary of Three East Kimberley Dialects, by E. B. RIGBY.

English.	Walki.	Munmulla.	Nowilnowilanna.
Afraid ..	chilbilbum	chilbim.	
All right ..	orañä	orañä wiñä	orañä, nachi (<i>lit.</i> <i>good</i>). chriwäji.
Alligator ..	kiwädi	chriwäji	
Along ..	yakingüm - läñgärra	yakingümbi-iran, närä iran.	
Angry ..	wiüm	wiümbi, wärriwän (<i>bitter</i>).	
Another ..	pangari, cujarra-pangari.	pangari, ngalgolän ..	pangari.
Arm.. ..	anguga	angoka, angugu ..	anunga.
Back ..	tërlum	tërlam	terlum.
Bad ..	jigilim	jigilimbi-ira, yälgurin	
Bandicoot ..	kunawjil .. ..	.. ..	pukapuka.
Beard ..	towarum	towarüm, cajillam (<i>jaw</i>).	towarum.
Bee ..	wäñägi	wäñägor, këria ..	wäñagi.
Before ..	koboa	kaba-irau - birabinda, wallöñijërri (<i>first</i> <i>time</i>).	
Belly ..	cham	cham	cham.
Belong ..	yäriängomëri..	yäriängomëri..	
Below ..	illigin.. ..	yëlligi, ngiriborun ..	
Big ..	nowara	nowara	bandilla-moriñun.
Bite ..	oriambiri	oriambadi, ngirimim	
Black ..	jälüm	jelüm	jelüm, jigälüm.
Blood ..	giowla	giowla, dowlu ..	cöllöngul.
Bone ..	kujil	kujinöi.	
Boomerang ..	käräbri	käräbri	käräbri.
Boy ..	wäñäki	wäñäki	yarrabinbi.
Break ..	tubad-jarra ..	tumtärä, traji ..	dibjennän.
Breast ..	.. ..	mangäm.	
Breath ..	pumäräñä	pumärära, yarrun.	
Brother ..	yowärüm	ngaji.	
Burn ..	bobiunaranji..	bobiarun, bobobi- añgari.	
Bury ..	thura-gwiamtëri	boloi, thura-gwiam- bëri.	
Call ..	marrabarrim ..	powpowera-burra, marrabarrim.	
Carry ..	wandagbamberi	wandagbamberi.	
Centipede ..	trinji	trinji, pirkulag.	
Child ..	wäñäki	wäñäki	yarrabinbi.
Claw ..	yandara	yandara.	
Clean ..	burlam	ngäñalam-ira, ngäñlin	barrä lälüm.

<i>English.</i>	<i>Walki.</i>	<i>Munmulla.</i>	<i>Nowilnowilanna.</i>
Climb ..	purtek-yarra ..	purtek-yarra, müt-barun.	
Close (near)	ngëriban ..	ngiriban.	
Cloud ..	kölüm tön ..	kowi.	
Club ..	nowla ..	nowla.	
Cockatoo, white.	lapäl ..	läpal	mallawil.
Cold..	wängüm ..	wängüm, türä - un-iran.	
Come ..	purümpurüm ..	pierongi, marra ..	ngirik.
Come (with me).	purüm-päjalüm ..	marangi.	
Come on ..	maranürbir ..	marangi.	
Come up ..	trambiri ..	trambiri.	
Cook ..	öërbambira ..	tumban (<i>fire</i>).	
Corroboree	chunbal ..	chunbal, malaujira ..	chunbal.
Cough ..	kundu ..	kundiri.	
Country ..	wallälji ..	wallälji	wallälji.
Cover ..	kobbuliamberi ..	kobbuliamberi.	
Crawl ..	.. ..	marramarra-u-ulmi.	
Creek ..	muttawarra ..	muttawarra, yanam ..	yanam.
Cry ..	ngadangadao. .	ngadangadao.	
Cut ..	karrigbamberi ..	kadigbamberi.	
Dark ..	.. ..	manbin.	
Dead ..	digbella-barüngaban. .	digbella - beran-a-dig-bella-iran.	
Deep ..	.. ..	ngëribowrun.	
Devil (white man that goes about.)	chuarim, yuarim-guanim.	chuariuga-nam-irau. .	yuarim-guanuiga.
Dig ..	traburra ..	tarabira.	
Dingo ..	tulam ..	tulambi	tulam.
Dirty ..	churdum ..	churdum	warra-ulwa.
Drink ..	olag-yera ..	mola-yarra-wüira.	
Dry ..	turbam ..	turbam.	
Early ..	ñigan-ari, kombulan. .	ñigan-ari.	
Ears..	yardum ..	yardum	yambirum.
East ..	kolor-berigbi-ija ..	kolor-berigberi-ira.	
Eat ..	jamjam, yangyera ..	yangyera	yangyera.
Elbow ..	chunkum ..	chunkum.	
Empty ..	ñininima ..	ñininima.	
Every ..	kara-iirim ..	ka-iirim.	
Eye..	molo ..	molayera, mula.	
Eyebrows ..	wärramilla ..	piberri, piwarra.	
Face..	molum ..	molum.	
Fall ..	burbak-barown ..	burbak-barown.	
False ..	yakoninji-nowin ..	yakoninji-yowi.	
Far away ..	ñiwal ..	ñiwal, marädgilli-ira. .	ñiwal.
Faster ..	wärangun ..	wärangun	wärangun.
Fat ..	äntagallin ..	antagallin.	
Father ..	.. ..	ngabun.	
Fetch ..	kürä-irra-yarra ..	kürä-irra-yarra ..	küräyärürän.
Fight ..	.. ..	werrimwerrim.	
Fill ..	ombolyibarra ..	omboljibara-niran.	
Find ..	.. ..	kollingajalli.	

English.	Walki.	Munmulla.	Nowilnowilanna.
Fingers ..	mallam	mallam	mallam.
Finish ..	kürrabiamberuu ..	kürrabira-mi-ira.	
Fire ..	tumbak	tumban	kechowerum.
First ..	buriñgiama	buriñama.	
Fish ..	konarim	konarim.	
Five (or any large number).	chëraki	chitakan	warrangarri.
Fly ..	bunul	bunul	bunul.
Fly (march)	kulalji	kürjalji	burrdi.
Foot ..	tambala	tambala	tambala.
Forget (not remember).	bokoñara	bokoñara	bokoñara.
Four ..	unulako, murgimda ..	murrgamurrga ..	malakown.
Full ..	paliambëra	puli-iran.	
Get ..	pibiñmbërum	pibiñmbërum.	
Girl ..	kollakolla - bullum, woolloomoolool.	ngianip, wiññuur-barun, woolloomoolool.	yëmanñni.
Give ..	witbëñigbëri	witbëñigbëri	witbëñigbëri.
Go ..	jimenkilli	jiminkilli-ñu-irau ..	kimenkillem.
Good ..	konagyamberum, balmanben.	koniñgyamberum, balmanben (kakin, mungowl) (<i>Yamandil words</i>).	balmanben, nachi, tamalin, kangì.
Gum (from spinifex roots).	kalla	obëdowrun, chertui or chertwi (<i>dust, dirt</i>).	
Hair ..	yamberun	tumu-burrun.	
Hand ..	mallam	mallam	mallam.
Hang ..	ta'bamberi	tatbamberi.	
Hard ..	lädginamayü	ladginamayü.	
Have ..	pibiamberum	pibiamberum.	
Hawk ..	tumu	gillalmi, girgunji.	
Head ..	tumu	tumu	tumu.
Hear ..	angkoruniñ	yardomira.	
High ..	piringbi	piringbi.	
Hill ..	kanarum	kanarum	ngaringa.
Hold ..	königwämbarim ..	königwämberum.	
Horse ..	libin (<i>a West Kimberley word adopted under the idea that it was English</i>).	wakuin.	
Hot ..	mallalom	mallalom	mallalom.
House ..	tam	tambi, taki	taunga.
Humming stick.	.. ..	karakal, biliangun.	
Hungry ..	koningbu	puralam, koninbi.	
Hush ..	charago	charago	würrawürriara.
I ..	ngiñ	ngiñ, ngiñnoki ..	ngiñ.
Ibis ..	chattami	chattami.	
Iguana ..	kañari	kañari, kurrdi (<i>lizard</i>)	kurrdi.
Java sparrow (or any small bird).	jirgul	jirgul	jirgalla.

English.	Walki.	Munmulla.	Nowilnowilanna.
Kangaroo ..	jeri	jerimbi	jeri.
Kill	digbella-barangabun, wējiba (<i>hurt</i>).	digbella-ñu-irau, wējibara (<i>hurt</i>).	
Knee	manjura	manjura.	
Knife	ngakin	ngiira.	
Knock up ..	ngeligyerown ..	neligi-ira.	
Know	bokōm	bokom.	
Laugh	kālkālā-bārānā ..	kālkālā-bārānā.	
Leap	chargwarum ..	chargwarum, jakiruni.	
Leave	wiini	wiinibarra	wiini.
Left hand ..	.. ..	burraburra.	
Leg	yowara	yowara	yowara.
Lift up	tumbarim.		
Like (simi- lar).	wiini-injin ..	wiini-ira.	
Little	wānagūl	wānawārra	wāllalael.
Long time ..	ahmum (<i>lengthen a to suit the time</i>).	ahmum	kallalubgin.
Lose	ñinanuma	ñeñow-ura.	
Man, old ..	mūñāmbūrri ..	munamburri ..	munamburri.
Man, young ..	mālyara	nālyara, māllilem ..	waninunga.
Matter (what is).	kōblō.ā-kē.ima ..	kobbon-kerima.	
Moon	kanga	chowranji	chowranji.
Morrow, to-	nākāmīllan ..	ñigan-wiiran (<i>night come up</i>).	
Mosquito ..	kulinji	kulinji	ñiñwinji.
Mouth	tōndum	tōndum	dongana.
Mud	numbam	numbai.	
Native com- panion.	kurundal	kurundal.	
Near	ngyangyītbir ..	ngyangyītbir ..	ngēriban.
Neck	olam	olam.	
New	kujakobarana, ngol- mēru.	ngolmeru.	
Night	ñigan	ñigan	ñigan.
No	muan, antabarana, nakingum.	moan, nganbara ..	muangaga, mua- gan.
Nose	manilla	manilla, minbari ..	yegonan.
Ochre (red, used for paint).	patil	patil.	
One	chērowi	chērowi	cherowi, chera- gun.
Paper - bark tree.	wuranji	langunda	wuranji.
Parrot, rose- crested.	.. ..	kurukkurukūal.	
Penis	ñawun	ñawun.	
Pitury	kangulan	kangulan.	
Play	puriāra	puriāra.	
Pouch (dilly- bag).	yowinji	yowinji.	
Quickly ..	warangan	warangun	warangan.
Rain	chatan	chatan	chatan.

English.	Walki.	Munmulla.	Nowilnowilanna.
Rainbow ..	tariaril	tariaril	tariaril.
Right hand..	.. ..	ngurrangurra.	
River ..	warraminim, mutta- warra.	muttawarra, narago, yanam.	yanam.
Rope ..	undunin	unchini.	
Rub.. ..	pongali, pia bamera	pia-bara.	
Run away ..	yurbari, wijibare ..	yurbari.	
Salt ..	karingumbi	karim	talin (cf. Sea).
Same ..	wiiniga-injin	wiini-ira	wiini.
Say ..	pijong, jarrok ..	kejao, kejam, jarrok..	kejam.
Sea ..	kállarum	kallarum	talungurra.
See ..	murlo - tẽrwamberi, marga - dugbaru — See! (exclamation).	mulu-tubamera.	
Shadow ..	mongul	mongul	mongul.
Shake ..	othed-bamberi ..	wangad-beri.	
Shield ..	mital	mital.	
Shoulders ..	turnali	banala	burr'nuindin.
Shout ..	charra-yarrun ..	charra-yarrun ..	charra-yarrun.
Shut ..	chura-bamberi ..	chura-bari.	
Sick.. ..	waranbarran, wiji ..	warranbarana, waran- jin.	warangi.
Side.. ..	wallanbum	wallanbum.	
Sit down ..	rodianun, ürt-barun. (The compounds of "ürt," to stop, refer more to the act of stopping.)	ü'urtjibarra, rodianun, rod'ibarana.	lola-yuarowi.
Skin ..	walum	walum.	
Sky ..	wãrdal	wãrdal, tirinji.	
Sleep ..	moryin	moryin	moryin.
Slowly (with care).	marga.. ..	marga.. ..	marga.
Smoke ..	wangim	wangim.	
Snail ..	yẽmur	yemur.. ..	yemur.
Snake (gene- ral name).	ngamari	ngamari	ngamari.
Soil (ground) ..	.. ..	obedowrun.	
Spear ..	kalumbi	kalumbi	kalumbi.
Spear-head ..	chimbala	chimbala	kanillambi.
Stand up ..	thadbaru	thadbaru.	
Stars ..	wãrdal-waãagul ..	wãrdal	wiũuwanim.
Steal ..	pibumberamba ..	pibumberamba.	
Stone ..	ngari	ngari	ngari.
Stop ..	uryibarana - marga, lungi, ürt, uri-iji- arun.	uryibaran - a-marga-a- a-iran.	ürt.
Sugar - bag (bees honey).	karai	karai.	
Sun ..	banda.. ..	banda	bandul.
Swelling (blister).	merjil.. ..	merjil.	
Swim ..	ngiragana	ngira-gĩ-ara.	
Take away ..	marrabarãji-burra ..	marrabarana, mara- biara-iranbiri.	

<i>English.</i>	<i>Walki.</i>	<i>Munmulla.</i>	<i>Nowilnowilanna.</i>
Take off ..	pallalgumbera ..	pallalgumbera ..	lolabamberra.
Talk ..	pijong, jarrok ..	kejao	kejam.
Tarantula ..	banji	banji	banji.
Teeth ..	minduit	mindui.	
That one ..	tantua	lirkuinji	inji.
There ..	tana	o'eringana.	
Thigh ..	balyara	balyara.	
Think ..	wi-inia	wiinia-ara.	
Thirsty ..	ulugunda	ulugunda.	
Three ..	murra-mukh, bang- yëri.	murrga-murrgan ..	murrga-murrgan.
Throw ..	ngiriara	ngiriara	ngiriara.
Throwing- stick.	yandal, ngallul ..	yangal, ngallul.	
Thunder ..	jimilla	jimilla	jimillering.
Toes.. ..	lirap	lirap.	
Tomahawk ..	pungam	pungam, ginalgi, lam- bura.	
Too tight .	.. ..	mando-papaya ..	chanko-papaya.
Track ..	.. ..	warrawarra-illa.	
Tree ..	koalin.. ..	koalin, makati-ira ..	koalin.
True ..	koninga - wichamjim- beri.	tiirambiri, witbam- beri.	
Turkey ..	tuloka	tuloka	tuloka.
Two.. ..	kujarra pangañeri ..	pangañeri	pangañeri.
Want ..	wichimbamberi ..	wichbamberi.	
Wash ..	logulo-logulbara ..	logulologulbara ..	loguliara.
Water ..	kolo'ë, kurnang, ko- lum.	kolo'in, kolum ..	kolo'ë.
West ..	dargun-wiirt.. ..	dargun-wiirt.	
Wet ..	kibaburowinji ..	chutam-wamiran.	
What is the matter?	kobbon-kerima ..	kobbon-kerima ..	kobbon-kerima.
What name?	kobbon-arun.. ..	kobbon-arun ..	kobbon-arun.
Where?	kowya, kayagilli. (The latter word was unknown till 1891, and then rapidly became universal.)	kowya, kayagilli ..	kowya, kayagilli.
Whirlwind, large.	chelowinan, konko- linal (chunan = small whirlwind).	chelowinan.	
Whistle ..	wiñarra	wiñira	uriñun.
White ants..	lanjalum	lanjalum	lanjalum.
White man..	chuarim, oldjin ..	chuarim, yuarim ..	yuarim.
Wind ..	kangali	kangoli.	
Woman, old	yemanini	yemanini	yemanani.
W o m a n , young.	kollakolla-bullum ..	wiñinñurbarun ..	yemanani - wirim- bi.
Wood adder	gunaji	pulinji	gunaji.
Yellow bark tree.	jinolin.		
Yes ..	wiñabarra, iyow ..	wiñabarra, iyow ..	ya, iyow.
You.. ..	nundu	ñingan, burrambi ..	ñingan.
Yuarim tree	yuarim.		

Bambiri is used as an affix to any noun with the general sense of "fetch or carry," as shovel-bambiri, pick-bamberi, but wandag-bambiri pick, etc., would be equally correct.

III. *Vocabularies of the Yamandil and Larrakia Dialects,*
by E. B. RIGBY.

English.	Yamandil.	Larrakia.
Afraid .. ..	.. ..	murjalming.
Afternoon .. ..	.. ..	gulinower.
All right .. ..	.. ..	bachi.
Alligator .. ..	.. ..	cumimbar, dongaliubar.
Another .. ..	.. ..	kalagowa.
Arm.	karail	gwiarrina.
Baby .. ..	.. ..	larri.
Back	koji. . . .	millangwa.
Bad	jigillim	allingin, gwara.
Bark .. ..	.. ..	manguruma.
Beard	towara	kukugwa, gueabalma.
Bee .. ..	.. ..	adgwa.
Before .. ..	.. ..	yallingan.
Belly	melia	mirrima.
Big .. ..	.. ..	kuligwa, gulingi.
Bite .. ..	.. ..	danbarigi.
Black .. ..	.. ..	numunqoi.
Blood .. ..	.. ..	yamajila, namijila.
Bone .. ..	.. ..	murn, tamarin, mojdka.
Bowels .. ..	.. ..	naman-namanak.
Boy	kowran, kaur-wran	kym.
Break	dubberiamberi.	
Breast	tornal	kuminkuppa, mamabilma.
Breath .. ..	.. ..	wumalin.
Brother	nachi	nella.
Brother, elder .. ..	.. ..	galaliva.
Brother, younger .. ..	.. ..	nininilla.
Bury .. ..	.. ..	ngagiup.
By-and-by .. ..	.. ..	alang.
Call	chara-nguliangera. .	nigowin-bigillup.
Camp .. ..	.. ..	gunegeirqua.
Canoe .. ..	.. ..	gunugarra.
Carry .. ..	.. ..	gwaninuna.
Centipede .. ..	.. ..	mallinma.
Child .. ..	.. ..	towara, children = banilla.
Clean .. ..	.. ..	ngarralngaralgwi.
Close (near)	ngeriban	kungwa-iparra.
Cloud	kaloa.	
Cockatoo, white .. ..	.. ..	ngangrangwarra.
Cold.	wangun	abbulduppi.
Come	marriowja.	
Come on .. ..	.. ..	nallak.
Crow .. ..	.. ..	gagabar.
Dark .. ..	.. ..	lamingwa.
Day .. ..	.. ..	gullinaua.
Dead .. ..	.. ..	bilingil.

<i>English.</i>	<i>Yamandil.</i>	<i>Larrakia.</i>
Dingo	tulam.	
Dog, tame .. ..	.. ..	mamarul.
Dog, wild .. ..	.. ..	milinga.
Drink .. ..	.. ..	anjarra.
Duck, black .. ..	.. ..	bēnemara.
Ears.. ..	karara	banarra.
Eat .. ..	.. ..	annukmaggai.
Egg .. ..	.. ..	biambar.
Elbow	chonga.	
Emu .. ..	.. ..	langura.
Excrement .. ..	.. ..	munmar.
Eye	molu	limurra.
Eyebrow	waramilla.	
Face.. ..	angara.	
Far away .. ..	.. ..	kobai.
Fat .. ..	.. ..	biowalba.
Father .. ..	.. ..	pēpi.
Fingers	mallam.	
Fire .. ..	.. ..	bokuxida.
Fish.. ..	.. ..	muḍḍuwa.
Fly, n. .. ..	.. ..	mulalwa.
Food .. ..	.. ..	kukeri.
Foot	tambala	qiälka.
Good	mungowl	bachinalla.
Grass .. ..	.. ..	malluelmall.
Ground .. ..	.. ..	gwialwa, guealwa.
Hair.. ..	warranu	birrjin.
Hand .. ..	.. ..	qiarwarra.
Head	tongola	malluma.
Heat .. ..	.. ..	erringergum.
Hill .. ..	.. ..	gumaruka.
Hungry .. ..	.. ..	ammunanding.
Kangaroo .. ..	.. ..	langutpa.
Knee	manjura.	
Know, I don't .. ..	.. ..	elabauna.
Laughing jackass .. ..	.. ..	lanurba.
Leg	tombio.	
Light, n. .. ..	.. ..	lalingwa.
Little .. ..	.. ..	muluchil.
Man, black.. ..	.. ..	beliwirra, barning.
Man, old .. ..	.. ..	lauraba.
Man, white.. ..	.. ..	angarrak.
Man, young .. ..	.. ..	mullenjin.
Milk .. ..	.. ..	gunnimkappa.
Moon .. ..	.. ..	lowrua.
Morrow, to- .. ..	.. ..
Mosquito .. ..	.. ..	lamda.
Mother .. ..	.. ..	wuding.
Mouth	nowala	gurbalga.
Native companion .. ..	.. ..	toluba.
Neck	jerawia.	
Night .. ..	.. ..	lamungma.
No .. ..	.. ..	alika.
Nose	kolmara	qianguar.
Opossum .. ..	.. ..	makmili.

<i>English.</i>	<i>Yamandil.</i>	<i>Larrakia.</i>
Pelican	<i>madarija.</i>
Plenty	<i>barotuk.</i>
Rain	<i>malmba, beaira.</i>
Sea	karai ?	.. ..
See	<i>nagalija.</i>
Shoulders	bambala.	.. ..
Side	telimbura.	.. ..
Sister	<i>anmalk.</i>
Sister, elder	<i>buerra.</i>
Sister, younger	<i>jeramuka.</i>
Sit	<i>aginda.</i>
Skin	<i>biaiaba.</i>
Sleep	<i>allinmingaligalmūji.</i>
Smoke	<i>lamuchala.</i>
Snake	<i>mijira.</i>
Spear, reed	<i>chinbala.</i>
Spear, war	<i>dowingwar.</i>
Star	<i>māmalla.</i>
Stomach	<i>gallama.</i>
Stone	<i>lamilla, karramulla.</i>
Sun	<i>latirra.</i>
Sweet	<i>manneh.</i>
Sweetheart	<i>adelik.</i>
Swollen	<i>wallah.</i>
Teeth	<i>unbirregi.</i>
Thanks	<i>lanki'ni.</i>
Thigh	<i>māka.</i>
Thirsty	<i>amangulipti.</i>
Throwing-stick	<i>billetta, bella.</i>
Thunder	<i>lalluelbal.</i>
To-day	<i>illuinwa.</i>
Tomahawk	<i>marangima.</i>
To-morrow	<i>emangwa.</i>
Tongue	<i>qimilla.</i>
Track of foot	<i>bietbar.</i>
Turkey, wild	<i>lamamu.</i>
Walk	<i>akgarni.</i>
Water	<i>qarrawa.</i>
Where are the blacks ?	<i>arabeliji belira ?</i>
Wife	<i>alladik.</i>
Wind	<i>guruwa.</i>
Woman, black	<i>barning-ceimcur.</i>
Woman, old	<i>gunul.</i>
Wood	<i>marriburma.</i>
Yes	<i>gu, ku.</i>
Yesterday	<i>gulawa.</i>

The *gua* in words for back, beard, big, etc., is merely an affix with no special meaning.

LARRAKIA NUMERALS AND PRONOUNS.

One, *kulaguk*; two, *kalletilik*; three, *kalletilik-kulaguk*; four, *kalletilik-kalletilik*; I, *anunga*; to me, *anigi*; you, *aejana*; to you, *denigi*.

The words in italic have been added from Foelsche's Larrakia Vocabulary in Curr's "Australian Race," vol. i, pp. 258, 259.

"The American Anthropologist," in Nos. VI and VII, for 1897, contains amongst other articles—"Wormian Bones in Artificially Deformed Kwakiutl Crania," by George A. Dorsey; "The Long Bones of Kwakiutl and Salish Indians," by George A. Dorsey; "The Missing Authorities on Mayan Antiquities," by Daniel G. Brinton; "Scopelism," by Robert Fletcher, M.D.; "The Beginning of Zooculture," by W. J. McGee.

"The American Antiquarian," in No. IV, vol. xix, contains amongst other articles—"Omitlan: A Prehistoric City in Mexico," by William Niven; "Mythologic Totems," by Stephen D. Peet; Migration of "Algonquin Tribes and Other Stocks" (fifth paper), by Cyrus Thomas; "The Sign of the Cross," by Lady Cook; "Ruins and Picture Writings in the Cañons of the McElmo and Hovenweep" (illustrated), by Lewis W. Gunckel; "The Houses of the Eskimos"; "Paleolithics in Egypt"; "Tomahawks and War Clubs"; "The Alaskan Natives on the Klondike"; "Aboriginal Boats on the North-West Coast."

"Revue Mensuelle de L'École d'Anthropologie de Paris," in the November part of 1897, contains:—"Les Monuments mégalithiques christianisés," by A. de Mortillet; "La Taille dans le département du Gers," by R. Collignon; "Antiquité de L'Homme," by G. de Mortillet.

"Journal of the Anthropological Society of Tōkyō," in Nos. 137-138 of vol. xii, contains:—"On some Haniwa Objects, recently discovered in Musashi and Hitachi"; D'Anvers' "Story of Early Man"; "Clay Human Figures from an ancient Sepulchral Mound in Hitachi."

Anthropological Institute

OF

Great Britain and Ireland,

3, HANOVER SQUARE, W.

MEETINGS

DURING THE

SESSION 1897-98.

TUESDAY, 1897	..	NOVEMBER	9, 23.
"	..	DECEMBER	7.
"	1898	JANUARY	11, 25.*
"	..	FEBRUARY	22.
"	..	MARCH	8, 29.
"	..	APRIL	26.
"	..	MAY	10, 24.
"	..	JUNE	14.

Specimens are Exhibited, and Coffee Served at 8 p.m.; Reading of Papers commences at 8.30.

Each Member has the privilege of introducing two friends (ladies or gentlemen) to the Evening Meetings.

* ANNIVERSARY MEETING.

The Council will meet at Five o'Clock on the days of Ordinary Meetings.

Officers and Council of the
ANTHROPOLOGICAL INSTITUTE
 OF
GREAT BRITAIN AND IRELAND
 FOR
1898.

PRESIDENT.

F. W. RUDLER, Esq., F.G.S.

VICE-PRESIDENTS.

H. BALFOUR, Esq., M.A.
 JOHN BEDDOE, Esq., M.D., F.R.S.
 E. W. BRABROOK, Esq., C.B., F.S.A.
 SIR JOHN EVANS, K.C.B., D.C.L., F.R.S.
 SIR WILLIAM H. FLOWER, K.C.B., LL.D., F.R.S.
 FRANCIS GALTON, Esq., D.C.L., F.R.S.
 RT. HON. SIR JOHN LUBBOCK, BART., F.R.S.
 PROF. A. MACALISTER, M.D., F.R.S.
 A. P. MAUDSLAY, Esq., F.R.G.S.
 CUTHBERT PEEK, Esq., M.A., F.S.A.
 LIEUT.-GENERAL PITT-RIVERS, D.C.L., F.R.S.
 PROF. EDWARD B. TYLOR, D.C.L., F.R.S.

SECRETARY.

T. V. HOLMES, Esq., F.G.S.

TREASURER.

A. L. LEWIS, Esq., F.C.A.

COUNCIL.

G. M. ATKINSON, Esq.	SIR H. H. HOWORTH, M.P.
W. M. BEAUFORT, Esq.	SIR HUGH LOW, G.C.M.G.
J. F. COLLINGWOOD, Esq., F.G.S.	R. BIDDULPH MARTIN, Esq., M.P.
WM. CROOKE, Esq., B.A.	J. L. MYRES, Esq., M.A., F.S.A.,
O. M. DALTON, Esq., M.A.	F.R.G.S.
A. J. EVANS, Esq., M.A., F.S.A.	J. EDGE PARTINGTON, Esq.,
J. G. GARSON, Esq., M.D.	F.R.G.S.
G. L. GOMME, Esq., F.R.S., F.S.A.	R. H. PYE, Esq.
W. GOWLAND, Esq., F.S.A.	C. H. READ, Esq., F.S.A.
R. B. HOLT, Esq.	COUTTS TROTTER, Esq., F.G.S.
Prof. G. B. HOWES, LL.D., F.R.S.	M. J. WALHOUSE, Esq.

ASSISTANT SECRETARY

J. APLIN WEBSTER, Esq.